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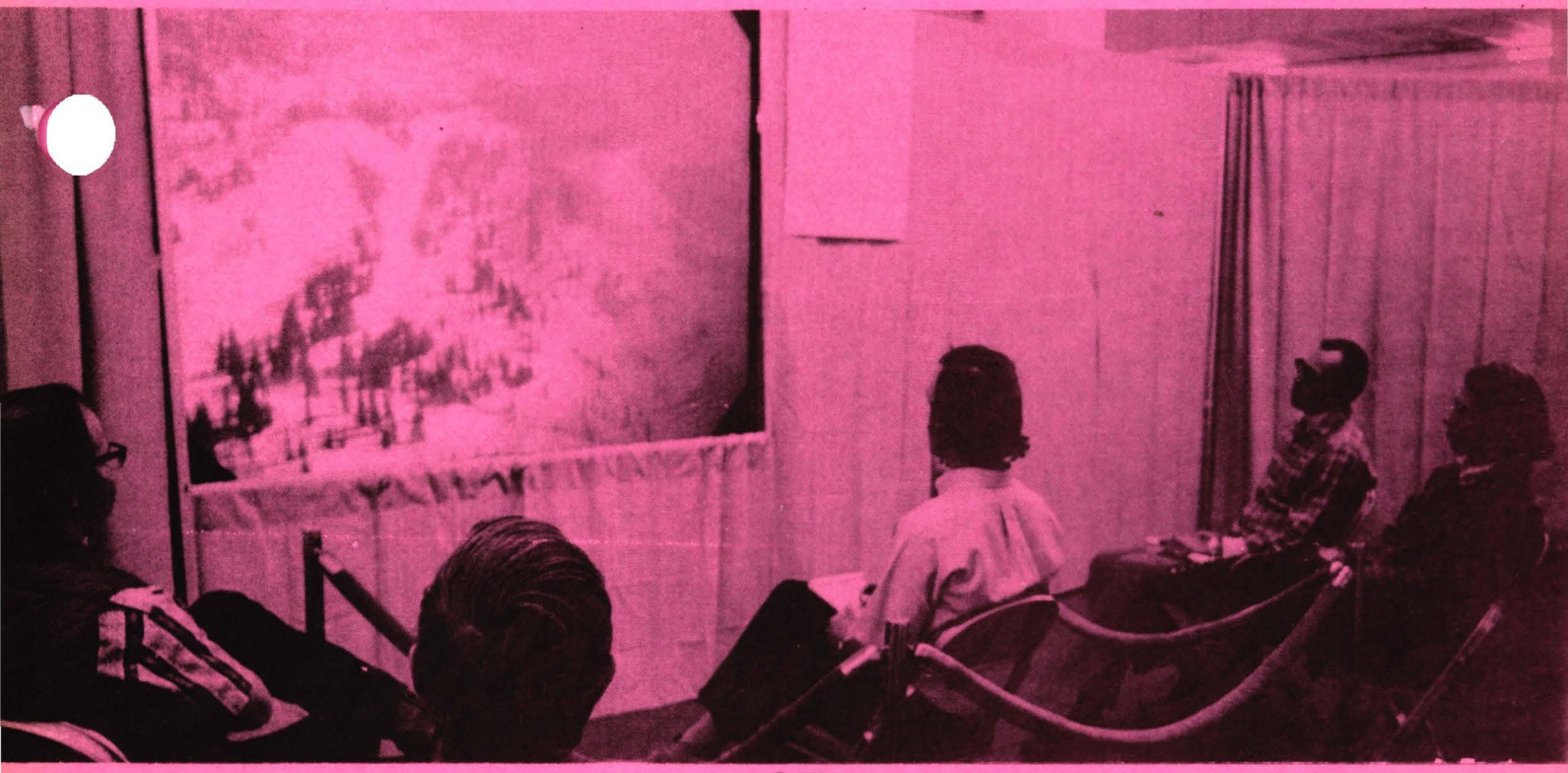
USING A *Simulation Machine*

FOR TRAINING IN

•AVALANCHE RESCUE•
•SKI AREA DEVELOPMENT•
•OTHER SNOW & WINTER ACTIVITIES•



1975

by
Dale Gallagher

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE

USING A

SIMULATION MACHINE

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Dale G. Gallagher

U. S. Department of Agriculture—Forest Service

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INTRODUCTION

Objective

The purpose of this booklet is to provide general guidelines on how to develop exercises for a simulation machine to assist in training people whose work is associated with snow and winter activities. The initial problems that have been worked up have been for training leaders in avalanche rescue. There are a number of other training possibilities, such as ski area development, winter maintenance of highways, etc.

Exercises can be quite simple or complex, depending on the needs of the trainees. A sample exercise is included in this guide. As other exercises are developed, a copy should be sent to the Alpine Snow and Avalanche Research Center, Rocky Mountain Forest and Range Experiment Station, 204 West Prospect Street, Fort Collins, Colorado 80521.

History

In the early 1960's, the U.S. Forest Service began working on a "simulation" machine to assist in training leaders in controlling forest fires. The first simulator became operational in 1963. Since then, the capabilities of the simulators have become more sophisticated and the size of the machines reduced considerably. Now compact, portable simulators are available at many points throughout the United States. (See Appendix for locations.)

In the mid 1960's, Charles McConnell and Dale Gallagher recognized that the "fire" simulator could be adapted for training leaders in avalanche rescue or leaders of other winter related activities. Norm Anderson and Dale Gallagher put together a simple program for the First National Avalanche School in 1971. This was expanded in the 1972 National Avalanche School to a more comprehensive and complex program which used two simulators and an overhead projector. Three different scenes from the same problem were projected on separated screens, and three sets of trainees were involved in the exercise simultaneously.

The simulator has a potential for use in many different types of training. Hopefully, in the future, these machines will be utilized extensively.

Credits

The basic factors of training and concepts of simulation in this booklet have been digested from the training guide, "Fire Simulator Instructors Guide," TT-81-(5100), U.S. Forest Service, revised August 1972.

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I. BASIC FACTORS OF TRAINING

Training should not be thought of as a cure-all to improving performance. Some of the factors which have resulted in effective training are:

- Schedule training just before the trainee may need to actually use the skills or knowledge. (For instance, just before the ski season.)

- Over-learning tends to slow down forgetting.

- A forgotten skill or knowledge is relearned much quicker than the time that it took to originally learn it.

- Subject matter and behavior will be forgotten if not applied, no matter what instructional method was used.

- Periodically have refresher training exercises to maintain the skills and knowledge. For training in handling emergency situations, this may mean several times each season.

- Establish detailed training objectives that can be measured.

- Present an "overview" of the job or task in your training.

- In the "Master Script," establish the proper sequence of tasks so it can be determined if the job is performed correctly.

- Provide for frequent and active response by the trainee.

- Give trainee immediate feedback on the correctness of his response.

- Have a summary presentation (critique) at the end of the training.

Your training program should include as many of these factors as possible.

II. CONCEPTS OF SIMULATION

Simulation, as it relates to these programs, means "like real - as much as practical." Simulation can be quite simple or very complex. Simulation in its simplest form could be setting up a certain situation on paper and then asking the trainee what he would do under a varying set of circumstances. Some of the most complex simulators are used in training astronauts where heat, sound effects, and smells are added to increase the realism. Experience and research has shown that the greater the degree of simulation, the greater will be the application of the concepts in real world situations. In other words, the more the simulation is like a real situation, the more effective our training will be.

We should remember, however, that the primary objective of simulator training is not to just create realistic situations. Our primary objective is to give the trainee the opportunity to review proper procedures for a given task and to identify and correct any deficiencies that he may have. To be most effective, this training should occur in a setting that is as realistic as possible.

A simulated avalanche rescue conducted in the field is truly a realistic situation. The problem arises, however, that it takes considerable time to set up a simulated rescue and a number of hours to conduct the problem. With a device such as a simulation machine, the realistic circumstances can be nearly duplicated, and the same training can be achieved in about one-tenth the time. Thus, the use of a simulation machine gives excellent training with a high degree of efficiency.

The Forest Service simulators are sophisticated teaching machines. However, the actual instruction for the trainee results from the program presented by the machine and the Instruction Team, and not from the machine itself. Generally speaking, the simulator capability far exceeds our present ability to use it.

The simulator, then, is a bridge between the classroom and the actual task on the ground, for example, an avalanche rescue. The simulator is probably best used as a supplement with and as a reinforcement for basic training. If the basics in avalanche rescue are given in the classroom and understood by the trainees, then the simulator provides an excellent medium for practical application.

Some of the desirable practices in conducting successful simulation exercises are:

- Remove all familiar surroundings (such as might be found in a classroom) from the simulator training area to prevent distraction. If items such as blackboards and clocks cannot be removed, they should be covered.

- It is best not to use the training area for the briefing or debriefing.

- Provide realistic working tools for the trainees. Examples would be maps, forms, photographs, plans, etc.

- Avoid misplaced humor which would be detrimental to the realism. (Examples: Funny names for role players or locations.)

In summary, the exercise and optical simulation should be as much like the real situation as possible. Rehearsal by the Instructor Team is essential to provide this realism and give a meaningful, worthwhile exercise.

III. SIMULATION MACHINE

A. Description

The simulation machine used by the U.S. Forest Service was originally developed to assist in training leaders in suppressing forest fires. However, this machine lends itself well to training a variety of tasks. It is particularly effective in training people to deal with emergency situations where sound decisions must be made rapidly.

Basically, the machine consists of four projectors accompanied by tape recorders for sound effects and communications equipment, such as telephones and radios. (See Figure 1.) The trainees are seated in an isolated enclosure in front of a large screen. The trainees have telephones and radios as well as maps, weather reports, plans, etc. (See Figure 2.)

Behind the screen is a master control booth. (See Figure 3.) Here the Instructors Team simulates a situation which presents a number of problems to the trainee to solve. This is accomplished by projecting a background scene on the screen with the special projection equipment. This background scene can be an oblique view of a hillside (such as you might observe looking across a valley) or a closeup view of a relatively small area (such as the debris of an avalanche).

Using avalanche rescue training as an example, the trainees would be briefed on a given situation and then asked to conduct a rescue using proper procedures. The trainee directs the rescue operation using radios or the telephone.

"Role players" in the control booth answer his calls, and the exercise progresses according to the instructions given by the trainee. Various sound effects, such as wind, helicopters, crowds, etc., are heard over the PA system to add realism. Through special projection equipment, avalanches can be made to "run" down the scene the trainee is looking at.

Actual problems that might arise during a rescue can be interjected by the instructors in the control booth. An example might be a request over the radio from the ski area manager (a role player) for some of the people at the rescue to return to the ski area because another serious accident has happened and they are short-handed. The trainee must decide priorities and deploy his personnel accordingly.

Another example of the capabilities of the simulation machine would be training probe-line leaders. The background scene might be the debris from an avalanche. As the probing progresses up the hill during the exercise, the flags denoting the area probed will appear periodically on the background scene. Also, the area probed will turn a slightly different color, as would be the case in an area that had actually been tramped over by a probe line.

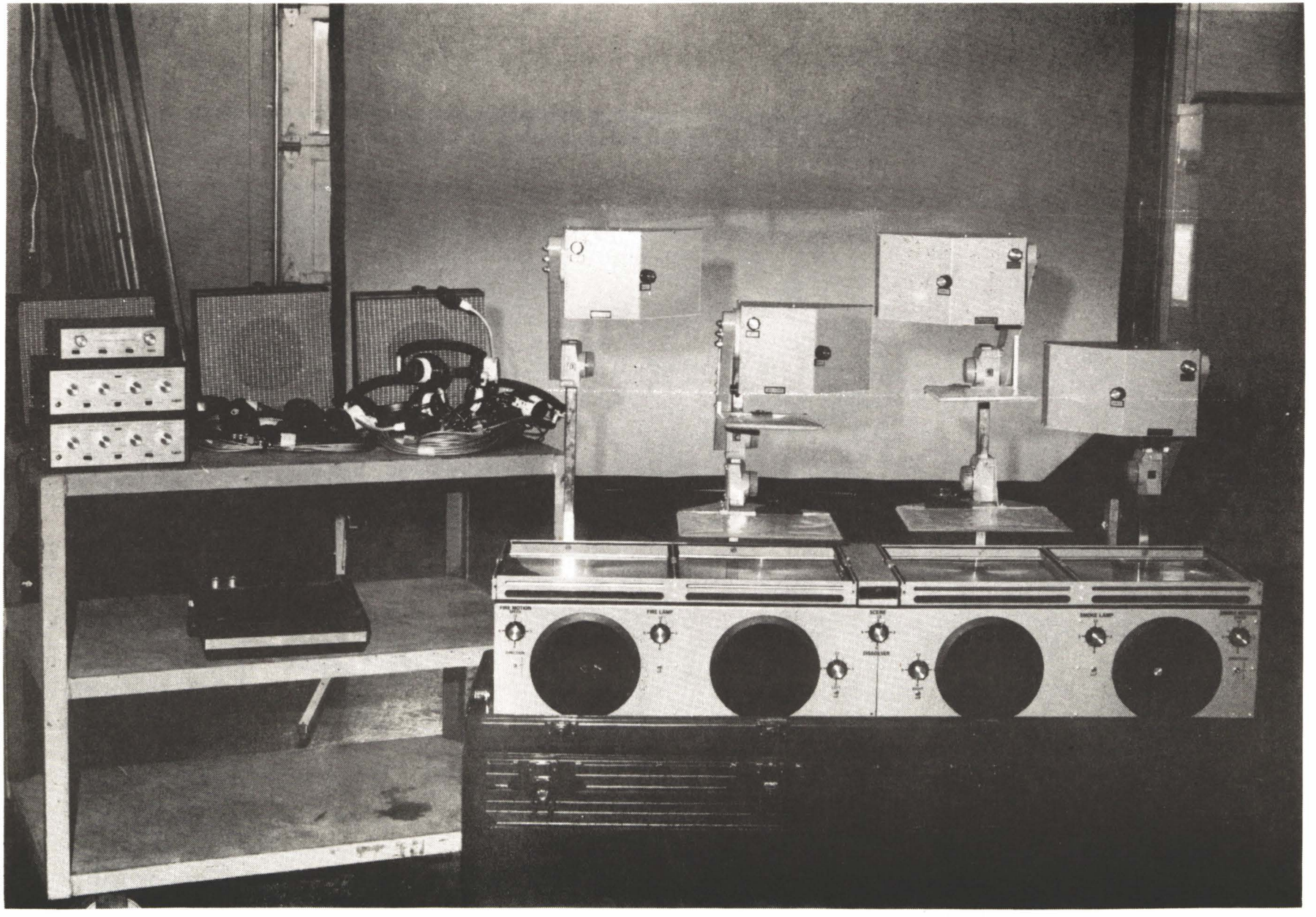


Figure 1. Typical arrangement for single-simulator exercise. Rear-projection screen in background. "Compact" simulator on right and communications and audio equipment on left.

Figure 2. Trainee (immediately in front of the rear-projection screen) serving as Rescue Leader in a simulated avalanche rescue exercise. Others are observers. Control booth is behind screen.

In times of emergencies, mistakes can be costly. In the simulation program, mistakes will be readily apparent to the trainee by the action that takes place on the screen in front of him. He then must decide quickly on an alternate plan of action to correct his wrong decision. It is far better that such mistakes be made in a simulation exercise than in the real situation.

The "compact" model of the simulator is contained in an aluminum box 51 inches x 21 inches x 19 inches and weighs 176 pounds, including case. (See Figure 4.) The screen, audio and communications equipment are contained in separate boxes. Specifications and details on this machine are in the Appendix. A list of where "compact" simulators are located is also in the Appendix. Forest Service personnel are available to train others in how to set up a simulator and its operation.

B. Uses

Though originally developed for training in forest fire control, there are a number of other potential uses for the simulator. Some of these are:

- Avalanche rescue
- Recreation area planning
- Winter sports area planning and expansion
- Avalanche control training
- Highway maintenance problems during the winter
- Searching for lost persons
- Mountain rescue and evacuation
- Debriefing and critique of an actual rescue or complex job
- Etc.

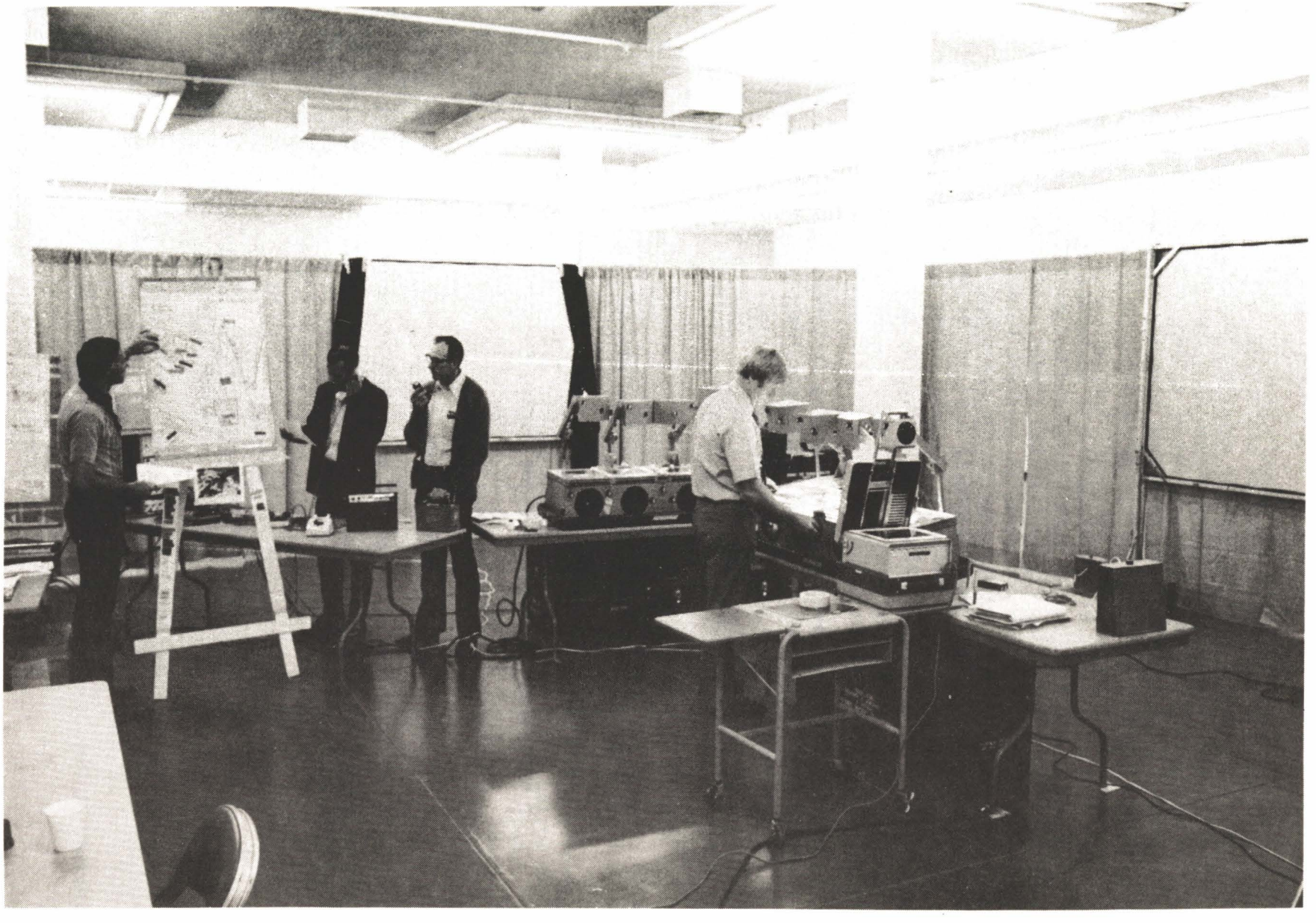


Figure 3. Control booth for complex problem using two simulators and an overhead projector. Three different sets of trainees can be trained simultaneously, all working on the same problem. Note: Radio, telephone, and resource/manpower locator board. Figure 6 is a diagram of this layout.

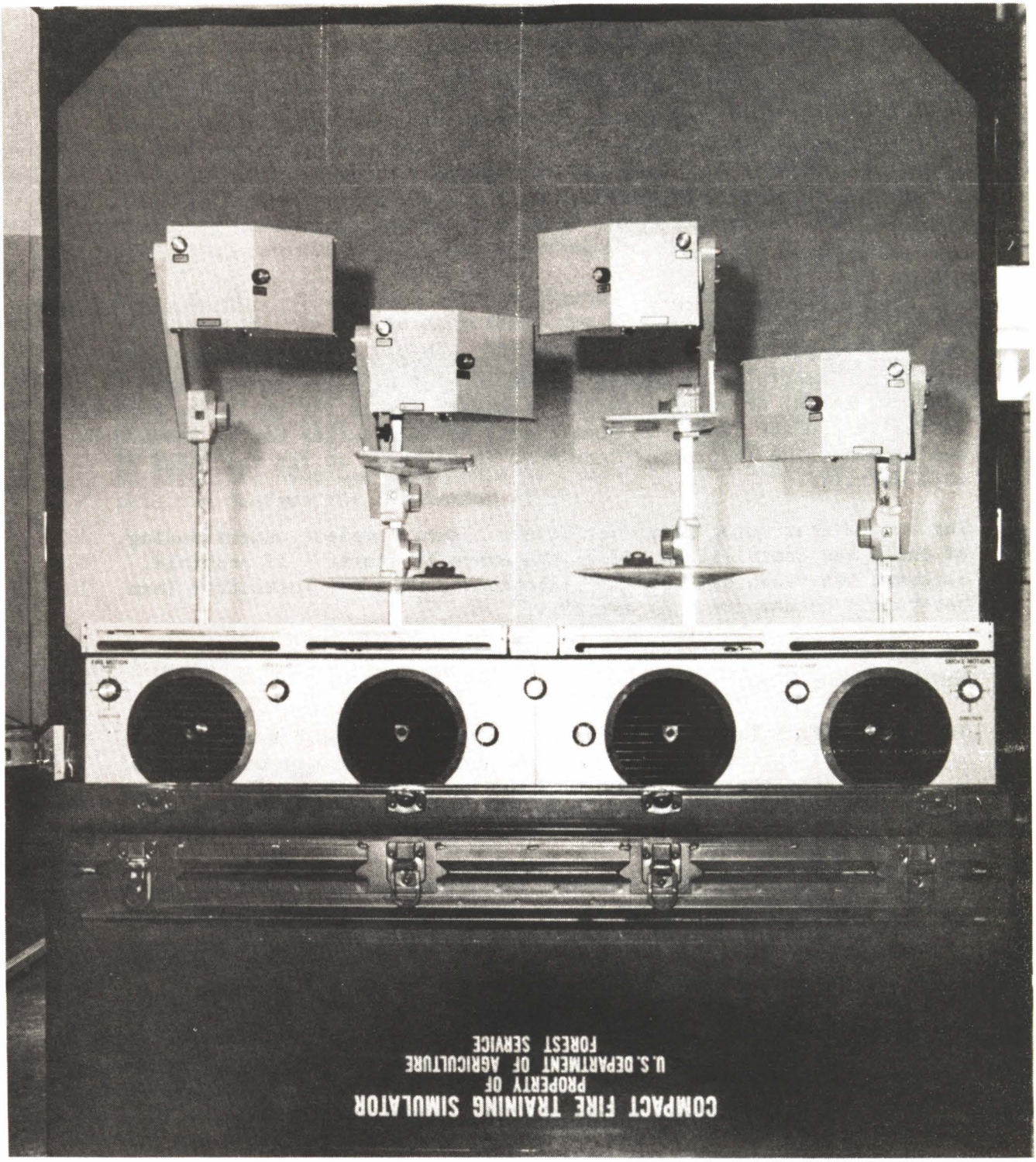


Figure 4. "Compact" simulator model. Simulator fits inside the aluminum case which is 19" x 21" x 51", and weighs 176 pounds complete. Rear-projection screen, audio and communications equipment are in separate boxes.

IV. SIMULATOR TEAM

In most simulator exercises, there are four major fundamental components of the Team. These are:

- Trainee(s)
- Director
- Simulator Operator
- Role Player(s)

The "Instructor Team" is composed of the Director, Simulator Operator, and Role Player(s). Depending on the type of exercise and its complexity, it may or may not require separate people for the three positions in the Instructor Team. In some cases, several duties may be assumed by one person. The Instructor Team must be tailored to fit the needs of each exercise.

The entire Instructor Team must have a clear, complete understanding of their responsibilities before the exercise starts. If possible, at least two rehearsals should be conducted with the Instructor Team before the actual training exercise.

Several things should be considered for each of the above components in the Simulator Team.

A. Trainee(s) - The number of trainees may vary from one to several. In a real life situation, would he function alone or with others? Usually the trainee should know the basic procedures for the task which will be given to him prior to the start of the simulator exercise.

   In order to train more leaders, the leader of any position can be replaced in the middle of the problem. At the briefing, it can be announced this will be done and that the replacement will be one of the observers. This instills the observers to pay close attention, since anyone may suddenly be called upon as the replacement.

B. Director - In the simulator, like on a rescue or any other job, there can be only one boss, the Director. In some complicated exercises, the Director may appoint an assistant. The Director, himself, must be currently qualified in the duties planned for the trainee in the exercise. That is, if the trainee is to function as a rescue leader, the Director must be a qualified rescue leader himself. The Director is fully and solely responsible for all activities of the simulator exercise.

C. Simulator Operator - The Simulator Operator takes orders from the Director and provides the required optical/audio effects at times specified. The Simulator Operator must know how the exercise problem would behave and would look in the real world. Clumsy simulation will destroy the realistic environment that is necessary for successful simulation. Thus, the Simulator Operator must have had considerable practice before the exercise. As a general guideline, it is best to complete all plate scribing before the exercise. Gradually unmasking previously scribed plates minimizes plate jiggling that can distract trainees during the exercise.

D. Role Players - The number of Role Players will depend on the exercise requirements. In simple exercises, the Simulator Operator or Director may double as a Role Player. Whenever possible, the Role Player should be familiar with his assigned role. For example, if he is asked to be a sheriff, he should be familiar with the basic procedures and characteristics of sheriffs. The same would be true if someone were asked to be a newspaper reporter. Role Players should avoid interjecting humorous statements or names into the exercise, since this can destroy the simulation effect.

V. LAYOUT OF SIMULATORS

A. Single Simulator Layout ("Simple" Exercise)

In a typical exercise, one simulator would be used for training one to three people. The scene could be a closeup view of a relatively small area, such as the debris of an avalanche. This might be used for training probe-line leaders. Or, the scene could be an oblique view of a distant hillside such as you might see from a low-flying airplane or from across the valley. An example might be a view of a mountain highway in winter which would be used to train road-maintenance personnel or a view of a mountainside for training in the planning and layout of a ski area.

B. Multiple Simulator Layout ("Complex" Exercise)

The layout can be expanded into a multiple-scene exercise where several sets of trainees are working on different phases of the same problem or task simultaneously.

The multiple-scene layout in Figures 3 and 6 has been used very successfully in teaching avalanche rescue. One of these exercises is included as a sample in the Appendix. In this layout, two simulators and an overhead projector were used.

The "wide-angle" overhead projector scene was a crowd gathering at the rescue cache (assembly point). The Dispatcher and his assistant were the trainees. An overhead projector was used rather than a simulator since no special optical effects were required for the scene.

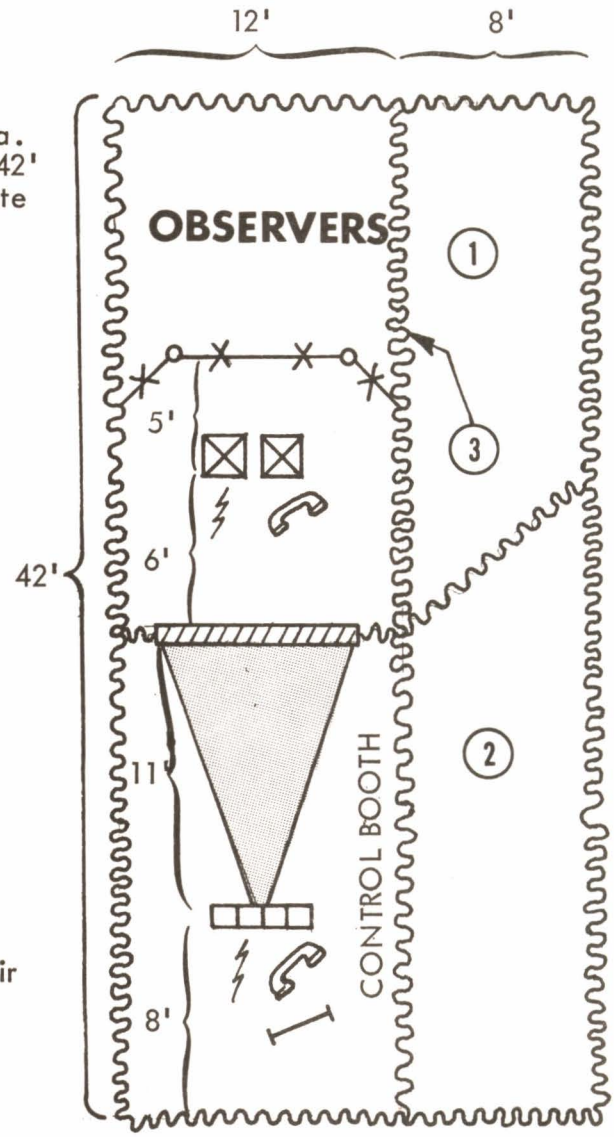
One simulator showed an oblique view of the mountainside. The trainee was the Rescue Leader who, when the exercise began, watched the main avalanche run down the slope. Other avalanches were released if mistakes were made.

The second simulator projected a closeup of avalanche debris. The Site Commander and Probe-line Leader worked with this scene.

All three trainees could communicate by radio between each other and to the role players back in the command booth. Each group of trainees makes their own decisions but coordinates them with the other two groups.

AVALANCHE SIMULATOR (Simple Layout)

MINIMUM ROOM SIZE: 12' x 42'. Briefings would be held in training area. Better size is 20' x 42' which allows separate area for briefings.



ELECTRICITY: Minimum needs are 3 separate circuits 110/120 (not outlets). Two are needed for simulator and one for communications.

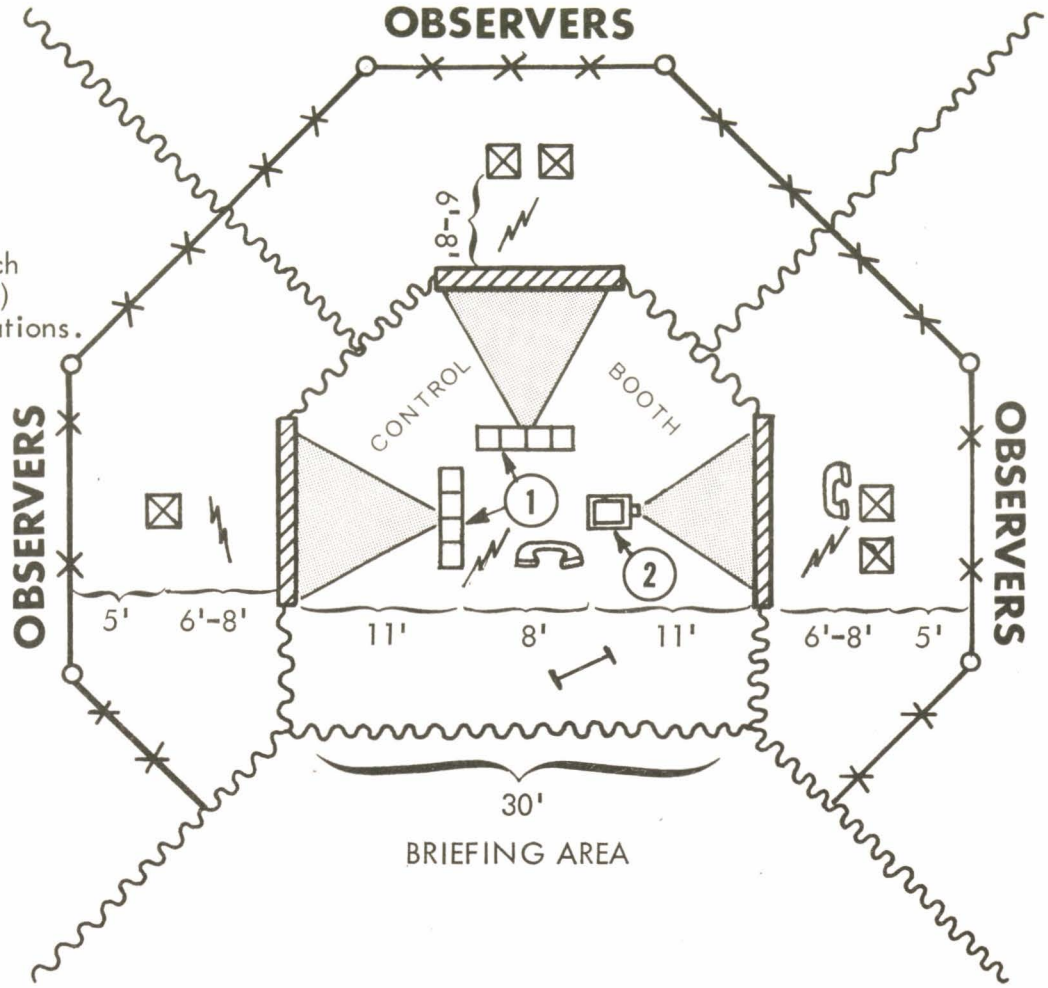
Trainee's chair
Radio
Telephone
Rope or Cord

Simulator
Rear projection screen
Partition, screen or curtain
Resource locator board

(1) & (2) Added area for recommended size room of 20' x 42'. Here partition (3) would be removed. Area (1) would be for more observers and area (2) for briefing.

Figure 5. Diagram of layout for single simulator. (Also see Figure 1.)

AVALANCHE SIMULATOR (Complex Layout)



ELECTRICITY REQUIREMENTS: As minimum this arrangement needs 7 separate circuits 110/120 (not outlets). Two are needed for each projection machine (=6) plus one for communications.

MINIMUM ROOM SIZE: 48 ft x 65 ft. This requires briefings to be held in one of the training areas. Best to have room 65 ft x 65 ft or 48 ft x 75 ft with separate briefing area.

(1) - Simulator
(2) - Overhead Projector
▨ - Rear Projection Screen
~ - Partition, screen or curtain

⊠ - Trainee's chair
↯ - Radio
☎ - Telephone
✕—✕ - Rope or cord
⊢—⊣ - Resource locator board

Figure 6. Diagram for layout for multiple-scene projection. Includes two simulators and an overhead projector. This arrangement allows training three trainees simultaneously in different leadership positions, while the one problem is being run. An example would be an avalanche rescue problem where you could train a Dispatcher, Site Commander, and Rescue Leader simultaneously.

With this layout, three to six people can be trained at one time, and it gives experience in coordinating actions between various leaders. The action develops as in an actual rescue. Action may be happening at all three scenes at the same time. Though the setup is complex and requires the Instructor Team to be alert every minute, it has several advantages over a single-simulator layout. Not only can more leaders be trained with the multiple-simulator layout, but it is more realistic since each set of trainees must coordinate their actions with the other two sets of trainees by radio.

C. Control Booth

The control booth area must have adequate room for the Instructor Team to operate. One or two tables are necessary for communications equipment, simulator supplies, etc. Figure 3 shows a control booth layout with two simulators and an overhead projector. Rear-projection screens are being used, and the trainees are on the opposite side of the curtains and screens. (See Figure 2.)

D. Resource/Manpower Locator

It is helpful to both the Trainees and the Instructor Team to have a sketch map of the oblique scene that is being used. This can be included as a handout to the Trainees at the time of the briefing. The sketch map should identify key locations that are in the exercise. Examples would be the base of the ski area, ski patrol room, lifts, ridges, avalanche area, rescue cache, etc. In addition, the location of communications should be indicated; that is, where radios and telephones are available.

A large version of the sketch map is very useful to keep track of where the personnel and equipment are located as the exercise progresses. By mounting the large sketch map on an easel, the manpower and equipment locations can be changed as they move during the exercise. This board can also be used for briefing and debriefing the trainees. (See Figure 7.)

One system which works well is to use magnetic rubber strips identifying various personnel and equipment. Magnetic rubber strips come in a variety of colors and can be cut to size with a pair of scissors. A piece of thin sheet metal can be added to a bulletin board, or you may use a metal easel. The sketch map is taped over the board or easel. The type of resource is written on the colored magnetic strip and the entire face covered with a clear cellophane tape to prevent the grease pencil from smearing.

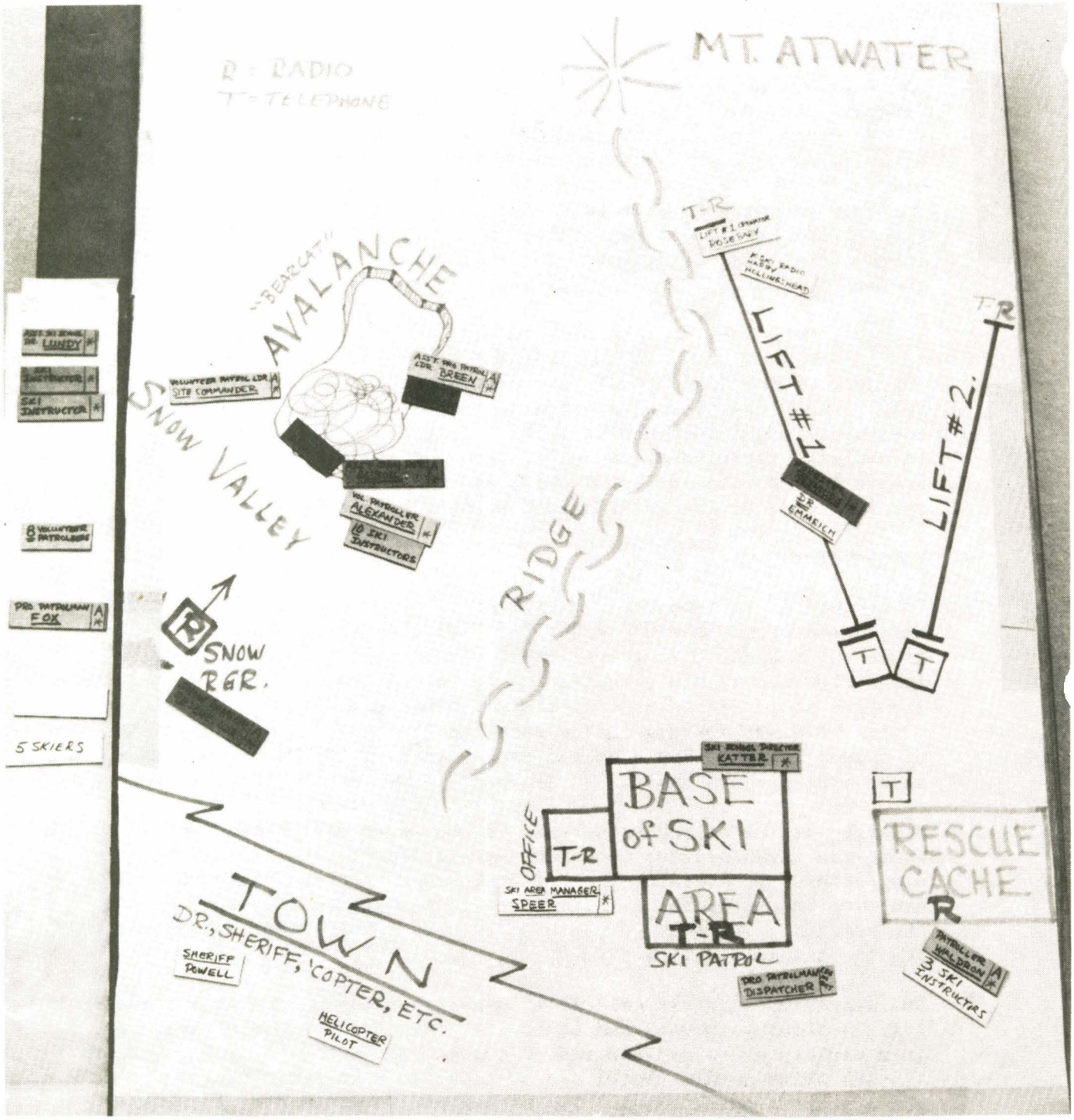


Figure 7. Magnetic resource/manpower locator board used in Control Booth. Thin sheet metal has been added to a 25" x 36" bulletin board. Sketch is of projected scene and includes basic terrain or topographic features. Locations of radios (R) and telephones (T) are indicated. Various colors of magnetic rubber strips are used to identify people and equipment and their locations. In this exercise, the people are coded to agree with the avalanche rescue plan as to their capabilities (A = avalanche rescue trained; * = familiar with area and can be used as a guide.) Blank strips are provided for identifying unanticipated people/resources.

Different colors of magnetic rubber can be used for quick identification of various types of people. For example, ski patrolmen might be blue, Forest Service or Park Service employees green, ski instructors gray, probe-line and hasty-search crew red, and miscellaneous people or equipment white (this would include ski area managers, lift operators, helicopter and pilot, sheriff, doctor, news reporter, etc.). Several blank pieces of magnetic rubber should be available to write on for unanticipated people or resources.

By using a metal board, the magnetic resource strips are easily moved. (See Figure 8.) It is the responsibility of each Role Player to move the magnetic indicator to the proper location as the exercise progresses or as his location changes. This allows the Director of the exercise to know exactly where people and equipment are at any given time.

The Resources/Manpower Locator board should be positioned where all members of the team can easily see it. It's also advisable, if available, to have a black-and-white photo of the background scene in the control booth. A good location for this is on the bottom of the Resource Locator Board. (See Figure 3.)

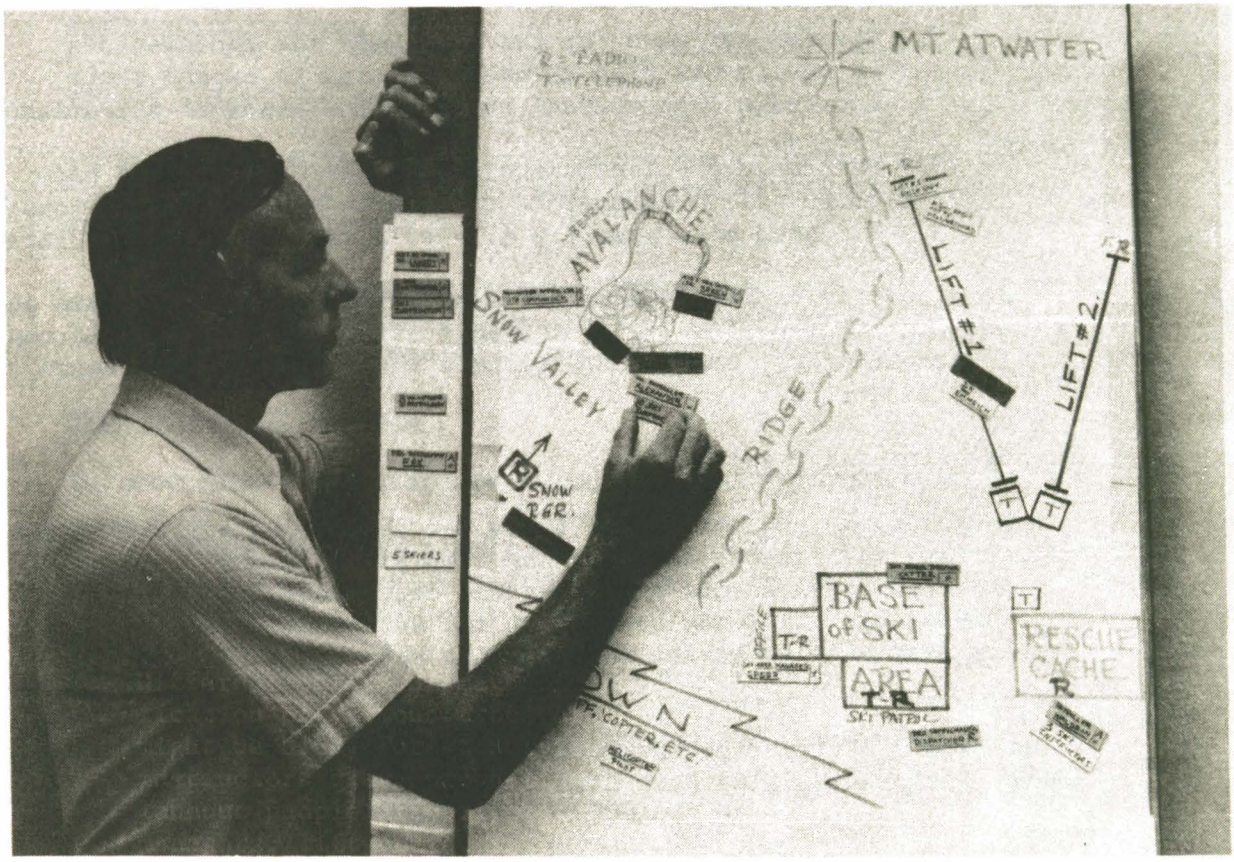


Figure 8. As personnel are dispatched during the exercise, the people and equipment indicators are moved to show their current location. This allows the Director to know exactly where the people and equipment are at any given time. The resource/manpower locator board should be placed where all members of the instruction Team can easily see it. This board is also useful during briefings and debriefings.

VI. PREPARATION OF AN EXERCISE

If the procedure outlined below is followed, you should have a meaningfull, effective simulator exercise. Before you write your simulator exercise, you should first analyze what type of training is needed. Next you should consider--can this training be accomplished through the use of a simulator? Once you have analyzed what your training needs are, the next step is to establish an objective for the training. When both of these have been accomplished, you are ready to design an exercise which, if properly conducted, will meet the objective you have set. Each of these steps are discussed in detail below.

A. Analyzing Training Needs

To determine what types of training are needed, you should first identify problems or deficiencies that could be remedied by training of some type. After identifying the problem areas, the type of training needs to be considered. Training basically falls into three catagories.

1. Fundamental - The trainees need additional basic knowledge or skills.

2. Specialization - The trainees know the fundamentals or basics but need further training to expand their knowledge into unusual or different kinds of situations.

3. Maintenance - The trainees know the basics, have had considerable experience in various types of situations, but need more practice or need a review for better retention.

As discussed earlier, there are many different ways to train people, and the simulator is one of the most effective. You should consider if the simulator can be used to meet the training needs which you have identified.

B. Establishing Objectives

Preparing an objective will serve the purpose of evaluating the quality and effectiveness of the simulator exercise. Without clear objectives, simulator exercises can degenerate into wandering "happenings" that may be fun but are not productive. Several texts are available to assist in preparing objectives for training.[1]

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[1] One book is "Preparing Instructional Objectives" by Robert F. Mager; Fearon Publishers, 2165 Park Blvd., Palo Alto, California 94306.

The objective should identify, in precise terms, the kind of performance that is needed to meet the identified training needs. As well as main objectives, there may also be subobjectives. However, a mistake that is commonly made is trying to design an exercise which will correct too many of the identified deficiencies in a single exercise. The objectives should describe what will be done and the standard that will be used to judge satisfactory performance. As an example, in avalanche rescue, the standard would be the text "Modern Avalanche Rescue", Snow Safety Guide No. 1, Wasatch National Forest, April 1968.

The objectives should be so written that it is clearly understood when the task will be completed and how much tolerance will be allowed from the normal standards. Basically then, the purposes of the objectives are to provide a standard of performance and furnish a means of measuring this performance. Examples of objectives for an avalanche rescue exercise are:

OVERALL OBJECTIVE

To strengthen trainees' ability to organize and direct avalanche rescues.

SPECIFIC OBJECTIVES

Rescue Leader Trainee

In accordance with standard avalanche rescue procedures, give overall direction to a successful implementation of a rescue, including the following:

--Within 10 minutes, dispatch Stage I
--Within 20 minutes, have Stage II dispatched
--Within approximately 1 hour, dispatch Stage III

Site Commander Trainee

In accordance with standard avalanche rescue procedure:

--Direct rescuers safely to accident site
--Establish areas of highest probability
--Implement actual search work

Dispatcher Trainee

In accordance with standard avalanche rescue procedure:

--Organize a group of volunteers
--Dispatch people
--Handle other situations that arise at the assembly point

C. Compiling Simulator Exercise

Given a detailed set of objectives, the simulator exercise should be written following the steps in the sequence outlined below:

1. Outline a realistic situation where the identified deficiencies could occur and where the trainee would logically be involved. Simulator exercises do not have to be built around a real experience. The situation may be a composite of events and situations from several case histories, or perhaps just from your imagination. However, all situations must be plausible. In any exercise, the following criteria must be met:

    a. The events and situations must be compatible with the objectives.

    b. The events must logically and realistically go together.

    c. Any event in the exercise must be justified to help achieve one of the prespecified objectives and/or to add realism to the exercise. In outlining the situation, you should describe the events that have already occurred before the trainees arrival on the scene.

2. Select a background scene(s) which best presents the requirements of the situation described. To the extent possible, you should let the nature of the objectives and the requirements of the simulated situation determine the background scene.

    It may be desirable to provide supplemental slides for the trainees' briefing (closeups of steepness of slope, snow conditions, etc.). If used, they should be listed and described in the briefing writeup.

    From a technical photography standpoint, it is normally preferable to have for the simulator exercise background scene, a relatively light or slightly overexposed scene. This can be darkened by dimming the simulator projector. Dark background scenes often cannot be brightened enough for satisfactory illumination.

3. Write a synopsis of the correct procedure for satisfactory performance for each trainee position. You should describe the general direction the successful trainee would take if he does not make errors in the exercise. The synopsis should describe the point when the trainee has achieved the objectives and the exercise is to terminate.

4. Determine possible incorrect actions which could be taken by the trainee. These will be included in the "Master Script" discussed below.

5. Determine the feedback methods you will use for communicating incorrect actions to the trainee so he knows he has made the wrong decision or that he has performed out of proper sequence. It is best to arrange a situation so the consequences of his error show up as soon as possible.

   Various methods can be used to give the trainee feedback on the nature of his error. Some of these are: (1) Changes in the appearance of the scene, for example another avalanche running; (2) Role Player (in character) informs trainee of the consequences; (3) An observer (Role Player) "happens to notice that....;" (4) During the debriefing, the Director tells the trainee his error and the correct decision or performance.

6. Determine the roles to be played by the trainees and by the Role Players. (See the discussion on Role Players in Section IV, "Simulator Team.")

7. Describe and list the resources, manpower, and equipment available for use in the exercise. Both the Trainees and the Role Players need this information.

   List the handouts the trainee will be given during the briefing. Examples are maps, weather forecasts, rescue plans, summary of the briefing, photos, etc. Material to be handed to the trainees can be printed on a different color paper so they are readily identified from the materials used by the Instructor Team.

8. At this point, a "Master Script" should be written based on the above background material. A "Master Script" is a condensed outline of the action that would normally take place. This includes:

   - The correct sequence and decisions which would take place if proper procedures are followed.
   - Possible incorrect actions of the trainee.
   - The feedback to be given to him if he does make the error.
   - Special visual effects.
   - Special sound effects.
   - Potential sound effects.

A sample format for the "Master Script" is with the Sample Exercises in the Appendix.

9. Compile a list of potential emergency inputs. These emergency inputs must be compatible with the objectives and can be added at the Directors discretion to give realism to the situation. (See examples in the sample exercise.)

10. Write the briefing for the trainees. The briefing should contain the following:

    a. Objective of the Training

       Include here the detailed training objectives.

    b. Use of Simulator Equipment

       Describe how the simulator equipment will be used and the general procedure that will be followed during the exercise.

    c. Ground Rules

       The following ground rules should be given to the trainee:

       (1) He is to remain "in character" throughout the exercise, conducting himself just as if he were working in a real situation; he must limit his conversation to the exercise, no questions answered, no excessive humor, etc.

       (2) Give him the actual role or part he will play in the exercise.

       (3) The time of day of the exercise.

       (4) The events that have occurred up until the time the exercise started.

       (5) The situation when the exercise begins.

    d. Exercise Assignments

       Assign the trainees to the positions that they will fill during the exercise.

e. Situation Statement

(1) Trainee Handouts

This material was listed in Section VI, C-7 above.

It is desirable to go over some of this material with the trainee during the briefing.

(2) Describe the Situation

Briefly cover the time of day, what has taken place prior to this time, resources available to them, the direction they are facing as they view the scene, review sketch map as it relates to the scene, weather factors, communications available, etc.

It may be desirable to provide supplemental slides showing closeups of steepness of slope, denseness of vegetation, snow conditions, etc. These can be used as part of the trainees briefing.

f. Seating Arrangement of Trainees

An example of a briefing outline is included in the sample exercise in the Appendix.

11. Special Arrangements

Maintain a checklist of special aids needed for the exercise, such as easel, resource locator board, tables, carbon paper, maps, photos, handouts needed, etc. An equipment checklist is included in the Appendix.

VII. CONDUCTING AN EXERCISE

It is very important that one and preferably two rehearsals be staged before an actual exercise is conducted. This will assist each member of the Instructor Team to have a clear understanding of their responsibilities during the exercise. Members of the Instructor Team should be sent copies of the Master Script (including maps, photos, etc.) several weeks prior to the rehearsal so they may study the exercise.

It is usually desirable to give the trainees the rescue and resource plan, photo, and sketch map the night before or at least several hours in advance of the exercise so they can become familiar with the general layout. In a normal avalanche rescue, for example, the rescue leader would undoubtedly be quite familiar with the ski area and the resources that are available. To be more realistic and fair to the trainee, you may want to allow him time enough to study this information.

A normal exercise of 1½ hours would be scheduled as follows:

Briefing	10 minutes
Simulation Exercise	50-60 minutes
Critique (Debriefing)	20-30 minutes

As a general rule, both the briefing and debriefing should be conducted outside the simulator "theater." The realism of the simulator theater will be maintained when it is used only for the exercise itself.

The briefing should cover the following:

A. Statement of Objectives should be placed on a blackboard or easel chart; should be given to the trainees in detail before the exercise, outside the simulator; and again reviewed during the critique.

B. Discuss with the trainees the use of the simulator equipment and the ground rules which will be followed. (See Section VI, C-10.)

C. Make the assignments for the exercise of the positions the trainees will fill and brief the observers (unassigned trainees) on their actions or jobs.

D. Give the handouts to the trainees and observers. A sample critique sheet to be used by the unassigned trainees (observers) is in the Appendix. This should be distributed prior to the start of the exercise. To facilitate distribution, this should be duplicated on a distinctive color.

E. The Situation Statement should be given outside the simulator. This brief statement should include the time of day, what the trainees can expect, what they are to do, and what they have to work with. Advise trainees of <u>direction</u> they are facing as they view the scene, and provide a map and/or photo.

If needed, show supplemental slides illustrating details of steepness of slope, vegetation, etc.

An example of a briefing is included in the sample exercises in the Appendix.

F. If the briefing is in a separate area, trainees should now be taken to the simulation "theater" to their proper seats. Final instructions (if needed) are given to the trainees after they are in the theater and/or just as the exercise begins.

The exercise is now conducted according to the Master Script and the decisions the trainees make. When the objectives of the exercise have been met, the exercise should be terminated.

In order that more people may receive leadership training, you may replace the trainee with one of the observers in the middle of the exercise. The replacement should be given the background data prior to the start of the exercise so he will also be familiar with the layout and resources available.

The trainees and observers should be moved to the briefing area for debriefing. Debriefing has three purposes:

—To give the trainee feedback not possible in the exercise itself.

—To give an overall summary of the correct sequence, procedures, etc., that did or should have occurred in the exercise.

—To determine if the objectives were, in fact, met.

The debriefing can provide, through emphasis and repetition, the highlights and objectives for the simulator exercise. Some points to remember in debriefing are:

A. One successful method of debriefing has been to have only the trainees discuss their own feelings about what they did, followed by the Debriefer. The Debriefer should review his Log with the Trainees. Comments from the observers, or from their completed individual critique sheets (which should be collected and reviewed by the Debriefer before or during the Debriefing), can be included if appropriate.

B. Avoid tendency for discussion to stray to small details—keep it oriented to the important Trainee action.

C. Do not permit lengthly discussion of simulation techniques; after all, the simulator itself is only a vehicle.

D. Know when to stop the debriefing. Some will want to keep on talking even though no purpose is being served.

E. Ask Trainees and Observers not to discuss the exercise with those who have not seen it.

F. It is usually desirable to have a separate projector and a duplicate slide or transparency of the exercise scene to use during the debriefing.

By now you may be overwhelmed by the amount of careful preparation and attention to detail that is necessary to prepare and conduct a successful simulator exercise. However, if the steps outlined above are followed, the result should be a quality exercise. The payoff of a truly good simulator exercise is when the task is actually performed in an efficient and safe manner. This makes your efforts and attention to details worthwhile.

VIII. PUBLIC RELATIONS

Whenever possible, it is desirable to seek publicity when using the simulator for training sessions. This publicity usually takes the form of demonstrations for the press, T.V. crews, cooperating agencies, educators, permittees, community organizations such as Service Clubs, and other key people. Emphasis should be placed on competence of doing a task and not on a dazzling display of simulator tricks. The following press release is a sample.

SAMPLE PRESS RELEASE

The Forest Service simulator provides a medium for training personnel in decision-making under emergency conditions. Included in the simulator are audio-visual devices, such as overhead projectors, rear-projection screens, sound effects, two-way radios, and telephones. With the aid of 4 projectors and 2 tape recorders, the simulator can reproduce a realistic situation, such as an avalanche rescue. Various manpower and equipment are deployed on orders from the trainee rescue leader. Realistic avalanches appear to "run" down the screen.

Seated in an isolated enclosure with telephone and radio, maps and weather reports, the trainees determine what men and equipment should be ordered and what action should be taken to successfully rescue the person buried in the avalanche. Their decisions are relayed to a team of experts consisting of a director, role players, and the simulation operator who manipulates conditions on the screen as they are affected by trainee decisions.

Throughout the exercises, actual problems are interjected by the instructors. An example might be a message from a ski-area manager (a role player) that another avalanche has trapped a car on the highway. The trainees must decide quickly on alternate plans of action. At the end of the exercises, the instructors will evaluate the trainee performances and analyze both strong and weak decisions.

For the trainee, the simulator fills a role somewhat like the complex flight simulators used to train Astronauts: When man finally landed on the moon, he already knew what to do through simulation training. Similarly, trainees can maintain and extend their skills through simulator training.

The Forest Fire Control Simulator is at _____
(Location)

for the _____
(Special purpose or training of specified group)

IX. MAINTENANCE OF SIMULATORS

Careful, complete maintenance is essential, particularly with the delicate optical and audio systems contained in the simulator. One individual should be assigned responsibility for overall management of the simulator. This should be someone who has had formal training in the operation and maintenance of the simulator equipment.

A sample checklist for inspection and operation is in the Appendix. This checklist is only a model and it may be necessary to add to the checklist the instructions for the specific simulator model you are using.

The optical and audio systems require special care. The following are general guidelines only, since detailed maintenance instructions are included with the simulator.

Optical Systems

Mirrors - Many simulator optical systems contain one or more mirrors, which are usually front-surfaced for best light transmission. This front-surfacing is very costly and delicate. For these mirrors, maintenance should consist of as little physical contact as possible to minimize scratching of the front silvering. Pressurized, dry air containers are commercially available to blow off dust that may accumulate. When major cleaning must be done, use high-quality lens-cleaning solution and high-grade lens paper for cleaning.

Tobacco smoke has a distinct degrading effect on mirror surfaces, mainly through accelerated tarnishing. For this reason, smoking should be prohibited in simulator areas (reference WO letter to Regional Foresters, 5100 - 9/12/67).

Lenses - The principles described above for mirrors apply equally well for lenses. Some lens systems are chemically coated to improve light transmission. Be sure to use only lens-cleaning solutions that do not damage the chemical coating on the lenses.

Some projectors include Fresnel lenses, a circular "bull's-eye" design that improves light transmission. These are often made of plastic that scratches easily and warps when heated beyond design limits. Be sure that projector cooling systems are fully functional and run for several minutes after projector lights are turned off to cool the units and avoid internal damage from overheating.

Bulbs - Projector bulbs are usually high-watt ratings and operate at very high temperatures. The glass envelope of the bulb can easily become distorted through uneven heating on the glass shell itself. Shell distortion means rapid bulb failure. For this reason,

> DO NOT HANDLE PROJECTOR BULBS (EVEN WHEN COOL) WITH BARE HANDS - USE TISSUE, WIPE OFF FINGERPRINTS TO ALLOW EVEN HEAT DISTRIBUTION ON BULB SURFACE.

This is a good rule for <u>any</u> projector bulb--movies, slides, etc.

Keep an adequate supply of spare bulbs. Through hour meter or other means, keep track of bulb life. When bulb life has about expired, change to new bulbs before starting a lengthy exercise series. Vibration (from shipment or otherwise) shortens bulb life considerably.

When bulbs or other major systems of the simulator fail during an exercise, the Director must terminate the exercise rather than limp along with poor simulation.

Belts - For those optical systems using moving endless belts to achieve flame and smoke motion, keep one or more spare belts, precolored for either flame or smoke. Belts can be colored with projectable-color felt tip markers available at larger stationery or office supply stores. Clear, uncolored belts can be obtained from 3M Thermofax dealers and some drafting supply stores.

<u>Audio Systems</u>

Tape Recorders - Perhaps the only component common to all simulator systems is one or more magnetic tape recorder/playback units. Some are monaural and some are stereophonic; some use reels, some cartridges, and some cassettes. All, however, need periodic maintenance. The best instructions for this maintenance are in the manufacturer's manual which must be kept with the overall simulator operations/maintenance instructions.

A money-saving hint: Use regular ethyl alcohol and Q-tip cotton swabs (both available from drug stores) instead of costly solvents for cleaning magnetic recording heads.

Summary:

- Assign to one man the management responsibility for any given simulator.
- Design a detailed operation/maintenance checklist.
- Incorporate manufacturer's maintenance instructions in checklist.
- Use the checklist faithfully.
- Seek the advice of the Forest Service communications technician.
- Handle mirrors and lenses CAREFULLY.
- Don't handle projector bulbs with bare hands.
- Keep audio tape magnetic heads clean.

APPENDIX

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LOCATION OF "COMPACT" SIMULATOR MACHINES
July '75

REGION 1 (Area: Montana, Northern Idaho)	Regional Office Federal Building Missoula, Montana 59801 Telephone No. 406-549-6511
Clearwater National Forest	Rt. 3 Orofino, ID 83544 Telephone No. 208-476-4541 Contact Bob Adams
Coeur D'Alene National Forest	Supervisor's Office Coeur D'Alene, ID 83814 Telephone No. 288-772-3283 Contact Paul Wilson
Bitterroot National Forest	316 N. 3rd Hamilton, MT 53840 Telephone No. 405-363-3131 Contact Rich Cromwell
Flathead National Forest	290 N. Main Kalispell, MT 59901 Telephone No. 406-755-5401 Contact John Robinson
Kootenai National Forest	418 Mineral Ave. Libby, MT 59923 Telephone No. 406-293-6211 Contact Harry Roberts
Lolo National Forest	2801 Russell Missoula, MT 59801 Telephone No. 406-549-2713 Contact Kenneth I. Young

LOCATION OF "COMPACT" SIMULATOR MACHINES
July '75

REGION 2 (Area: Colorado, East Wyoming, and South Dakota)	Regional Office P.O. Box 25127 Lakewood, Colorado 80225 Telephone No. 303-233-3611
Bighorn National Forest	Columbus Building Sheridan, WY 82801 Telephone No. 307-672-2457 Contact Charles L. Simon
Boxelder Civilian Conservation Center (Black Hills NF Box 792)	Box 47 Custer, SD 57730 Telephone No. 605-673-2251 Contact Rudy Anderson
Rio Grande National Forest	Rt. 2 Monte Vista, CO 81144 Telephone No. 303-852-5941 Contact Bob Joslin
Roosevelt National Forest	Rocky Mountain Bank & Trust Building 211 Canyon Fort Collins, CO 80521 Telephone No. 303-482-5155 Contact Dave Wright
REGION 3 (Area: New Mexico and Arizona)	None

LOCATION OF "COMPACT" SIMULATOR MACHINES
July '75

REGION 4 (Area: Utah, Nevada Southern Idaho and Western Wyoming	Regional Office Federal Building, 324 25th St. Ogden, UR 84401 Telephone No. 801-399-6011
Boise National Forest	Fire Center 3905 Vista Ave. Boise, ID 83706 Telephone No. 208-342-2568 Contact Robert A. Baker
Payette National Forest	Forest Service Building McCall, ID 83638 Telephone No. 208-634-2255 Contact Carl Spelman
Salmon National Forest	Forest Service Building Salmon, ID 83467 Telephone No. 208-756-2215 Contact James Moorehead
Toiyabe National Forest	Charles Mapes Building 111 N. Virginia Street Reno, NV 89503 Telephone No. 702-784-5331 Contact Jack Wilcox
Teton National Forest	Forest Service Building Jackson, WY 83001 Telephone No. 307-733-2752 Contace Gary Poulson
Uinta National Forest	Box 1428 Provo, UR 84601 Telephone No. 801-374-7245 Contact Gordon Colby

LOCATION OF "COMPACT" SIMULATOR MACHINES
July '75

REGION 5 (Area: California and Hawaii)	Regional Office 630 Sansome Street San Francisco, CA 94111 Telephone No. 415-556-5142
Cleveland National Forest	3211 5th Avenue San Diego, CA 92103 Telephone No. 714-293-5050 Contact Myron K. Lee
Eldorado National Forest	100 Fornie Road Placerville, CA 95667 Telephone No. 916-622-5060 Contact Don Arundell
Los Padres National Forest	42 Aero Camino Goleta, CA 93017 P.O. Box 30250 Santa Barbara, CA 93105 Telephone No. 805-968-1741 Contact Jim Bates
Sierra National Forest	Federal Building, Room 3304 1130 "O" Street Fresno, CA 93721 Telephone No. 209-487-5422 Contact Richard Nichols

LOCATION OF "COMPACT" SIMULATOR MACHINES
July '75

REGION 6 (Areas: Oregon and Washington)	Regional Office 319 SW Pine St., P.O. Box 3623 Portland, OR 97208 Telephone No. 503-226-3361
Wallowa-Whitman National Forest	Main and Auburn Sts. Baker, OR 97814 Telephone No. 503-523-6262
Gifford-Pinchot National Forest	500 W. 12th St. Vancouver, WA 98660 Telephone No. 206-696-4041 Contact Bill Maxwell
Siskiyou National Forest	1504 NW 6th Street Grants Pass, OR 97526 Telephone No. 503-479-5301 Contact Jack Fowler
Willamette National Forest	210 East 11th Street Eugene, OR 97401 Telephone No. 503-687-6522 Contact Glen Baker
Okanogan National Forest	129 2nd Avenue S. Okanogan, WA 98840 Telephone No. 509-997-2031 Contact Bill Moody
Olympic National Forest	Federal Building Olympia, WA 98501 Telephone No. 206-753-9544 Contact Vicky Gard

Compact Simulator *

Specifications

Used for training fire fighters, Avalanche rescuers, etc.

WEIGHT

The simulator weighs 176 lbs. complete, including case.

PROJECTORS

Four, image-reversing, overhead projectors are used. The left projector is for fire, right projector for smoke, or both may be used for running avalanches. The two center projectors are for background scenes.

IMAGE CORRELATION

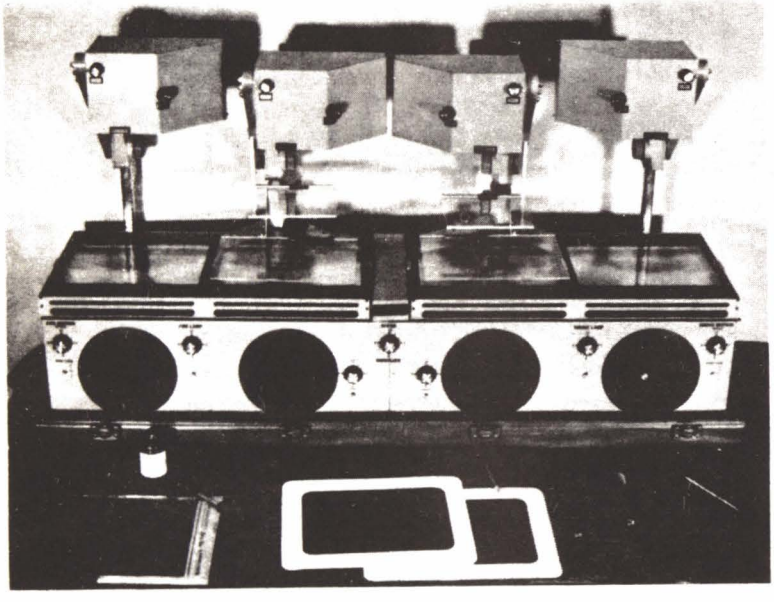
Correlation between writing stage on projector and viewing screen is point-to-point, i.e., left on stage is left on screen, top of stage is top of screen, etc.

LAMPS

Each projector uses one 1000-watt quartz halogen lamp.

POWER REQUIREMENTS

A standard 110-volt single-phase 60-cycle power source is needed. Provision is made for two separate 110-volt inputs each protected with a 20-amp circuit breaker.



MAGNIFICATION FACTOR

At a distance of 10 feet, magnification is 8X. That is, the 7½-inch x 10-inch apertures on writing stage projectors present a 60-inch x 80-inch image on a screen 10 feet away.

FOCUS

Each machine focuses individually.

OPTICAL ALIGNMENT

The optical axis of each machine is adjustable 12 inches vertically and 12 inches horizontally on the viewing screen.

MOTION EFFECT MECHANISM

Smoke, fire and avalanche motion are projected by rotating discs positioned between the light source and the working stage in the appropriate projectors. By repositioning or reversing discs with external controls, it is possible to simulate motion in any direction on the viewing screen.

CHAR OR SHADING EFFECT MECHANISM

Two clear Plexiglass plates above each scene projector provide a place for introducing smoke and fire char, or areas that have been probed in avalanche debris.

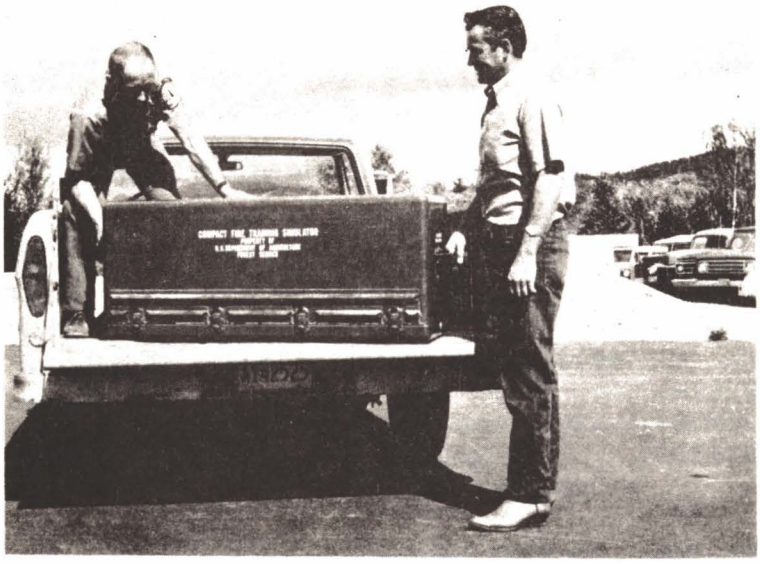
STORAGE CASE

The case is aluminum, moisture and dust proof, with a pressure relief valve for transporting in aircraft that are not pressurized. Dimensions are 51-in. x 19-in. x 21 in.

SOURCE: SCOTT ENGINEERING SCIENCES
1400 SW 8th St., Pompano Beach,
Florida 33060

COST: $3500-$4500 (no accessories)

*Revised from October 1972 "Equip Tips," USDA—Forest Service.



COMPACT simulator fits into pickup or station wagon.

Suggested Accessories for COMPACT Simulator

VIEWING SCREEN

A rear projector screen should be used. Minimum size should be 60-in. high by 80-in. wide. A good screen is the Polacoat Lenscreen with Fast Fold Frame and carrying case.

SOURCE: National Audio-Visual Corp.
1363 Chain Bridge Road
McLean, Virginia 22101 or

Polacoat Inc.
Blue Ash, Ohio 45242

COST: $252

DRAPERIES

Five-ounce black taffeta material sewn into 60-in by 84-in. panels with ¼-in. grommets every 6-in. along one end makes an adaptable drapery. These panels can be hung from wires strung between screen frame and photo flood tripods.

SOURCE: Local drapery and photo suppliers

COST: About $60-$75.

AUDIO SYSTEM

The audio system should be designed around individual or local requirements. A minimum system should include:

1. One or more means of communication between role players and trainees. (Examples are radio and telephone.)

2. Communication between the simulator operator, umpire-director, and observer in the trainee area.

3. Background sound effects simulating helicopters, artillery, hand placed charges, wind or for fire training, tractors, saws, aircraft, etc.

SOURCE: Components for suggested audio systems are described in detail and priced in the Beltsville Electronics Center publications "Compact Simulator Accessories."

COST: $400-$700 depending on audio equipment and options used.

ART MATERIALS

The following art materials are suggested:

1. Opaque material for smoke, fire and avalanche outline:

   a. Vugraph film, Bessler No. 7243-1 available through local art suppliers at about $8 per box of 50 sheets, or

   b. Scribe Coat, Stabilene Film, K & E No. 443207, .005 in. or .0075 in. thick. Available through K & E Co., suppliers at $.35 to $.70 per sheet, or

   c. Clear, smooth, 10-in. x 10-in., pane glass spray-painted on one side also works well.

2. Small knife with round-tipped blade for scraping away opaque material described in item one above.

3. Clear plastic overlay material for fire and smoke char, or other special effects. Cellulose acetate sheets, 9-in. x 12-in., .005-in. thick can be used.

4. Red or orange plastic transparencies for use under the opaque material on the fire projector to give fire color. (Not needed for snow exercises.)

5. Vugraph, color transparent pictures in pairs for background scenery. Have 35mm color slides of local scenery blown up into 7½-in x 9½-in. mounted Vugraph transparencies at custom photo laboratories. Can be obtained by mail order through James R. Dunlop Inc., Custom Photo-laboratory Services, 2321 4th St., NE, Washington D.C. 20002 from $11 to $14 per pair depending on quantities ordered.

6. Grease pencils, K & E touch-up fluid No. 582100, Speed-O-Paque red Photographic Film Opaque No. 1465-2, Projecto color pencils, paints, small art brushes, masking tape, and so forth, for designing and conducting simulator exercises. (Also see "Equipment Checklist" in appendix of this book.)

FIRE SIMULATOR EXERCISE

CRITIQUE SHEET

(To be used by unassigned trainees or observers)

Name _____

Date _____

Situation	Time Emerged	Trainee's Decision	You Agree?	Why	Your Decision

EQUIPMENT CHECKLIST

2 portable fire simulators

1 overhead projector

(NOTE: These are needed if complete (complex) problem is run simultaneously. One simulator is sufficient if the 3 scenes are run at different times—each as a separate (simple) problem.)

4 radios

2 telephones

Cassette Recorder and Sound tapes

Public address System

3 rearview screens

2 - 8" x 10" transparencies for each scene

5-6 - 8" x 10" glass plates

1 can flat black spray paint

1 bottle typing correction fluid (white)

Extension cords (#12 wire minimum)

25 sheets thin, clear acetate

1 each black, blue, and red fine felt-tip markers for overhead projectors (mark on acetate)

Scissors

Pencils and paper

Masking tape

Easel

Resource Locator Board

1-2 tables

Handouts

Trainees
- Map and/or sketch
- Photo
- List of available equipment and personnel (may be included in Rescue Plan)
- Rescue Plan (if applicable)
- Weather information
- Pencil and paper

Observers
- Critique sheet
- Pencils

Night lite for director (and extension cord)

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST								
BEFORE USE Inspection By : Date	AFTER USE Inspection By : Date	A. PROJECTOR OPERATION	PROJECTOR Scene (1)	Scene (2)	Fire	Symbol	Smoke
		1. Off/On Switch					
		2. Dimmer Control					
		3. Belt Speed Control					
		4. Belt Direction Control					
		5. Focus Controls					
		6. Light Control Shade or Plate					
		a. Light proofing					
		b. Paint, scraper, solvent on hand					
		c. Scribing; scribing tools available ...					
		d. Pre-scribing, opaqueing brushes & opaqueing compound.....					
		e. Hinged overlays, if used					
		f. Movable screens or masks					
		g. Cleaning					
		h. Replacement					

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST									
BEFORE USE		AFTER USE		A. PROJECTOR OPERATION (continued)	PROJECTOR				
Inspection By	Date	Inspection By	Date		Scene (1)	Scene (2)	Fire	Symbol	Smoke
				7. Bulb Replacement (Do not handle bulb with bare hand - use cloth or napkin) Spares on hand -- type:					
				8. Alignment					
				9. Lens/Mirror Cleaning					
				10. Cleaning materials on hand: Lens cleaning solution Lens paper Pressurized air cans for dust removal Others - as needed					
				11. Cooling fans fully functional - lubricated when needed					
				12. Air filters cleaned or replaced when needed					
				13. Manufacturer's manual on hand					

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST		
BEFORE USE Inspection By : Date	AFTER USE Inspection By : Date	B. AUDIO OPERATION
		1. Tape Recorder/Playback Units: a. Sound Effects
		(1) Aircraft - fixed wing and helicopter
		(2) Tractor
		(3) Trucks
		(4) Fire
		(5) Other
		(6) Counter readings for various types
		b. Response recorders
		c. Spare tape available
		d. Vu Meter Use
		e. Fuse Locations -- Spare fuses available - type
		f. Magnetic head cleaning -- Cleaner tape or ethyl alcohol and Q-tips

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST			
BEFORE USE Inspection By : Date		AFTER USE Inspection By : Date		B. AUDIO OPERATION (continued)
				g. Degaussing - get demagnetizer from hi-fi shop for $6-$8; Pass over heads from L to R
				h. Manufacturer's manual on hand
				2. PA System a. Inputs -- Director -- Other
				b. From mixer box
				c. Speaker placement
				3. Radio System a. Ground net
				b. Air net
				c. Other
				4. Telephone System

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST		
BEFORE USE Inspection By : Date	AFTER USE Inspection By : Date	B. AUDIO OPERATION (continued)
		5. Mixer Box
		6. Amplifier(s) a. Tone adjustments
		b. Volume adjustments
		c. Fuse locations
		d. Spare fuses available -- type:

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST		
BEFORE USE Inspection By : Date	AFTER USE Inspection By : Date	C. CONSOLETTE OPERATION
		1. Cabling installation and connection
		2. Component assembly a. Radio: -- Microphone: Pre-amp batteries? _____ Spare batteries on hand? _____ -- Speaker -- Channel selector
		b. Telephone: -- Handset _____ -- Signaling device; button, dial, etc. _____ -- Ringing device; buzzer, bell, light _____
		c. Light: -- On-Off Switch _____ -- Bulb -- Spares on hand _____ -- Type _____
		3. Mixer box connection
		4. Remote operation

FIRE SIMULATOR INSPECTION/OPERATION CHECKLIST		
BEFORE USE Inspection By : Date	AFTER USE Inspection By : Date	ITEM
		D. TOOL KIT -- Restocked per list of contents.
		E. AUXILIARY EQUIPMENT 1. Vacuum cleaner
		2. Brooms - brushes
		3. Waste baskets
		4. Shipping containers
		5. Chairs - tables
		6. Instruction manual: -- Operating procedures -- Equipment & Supply specifications -- Lists sources for materials
		7. Other

SAMPLE EXERCISES

SAMPLE EXERCISE "B" (Complex)

- BRIEFING
- MASTER SCRIPT
- DEBRIEFING
- HANDOUTS FOR TRAINEE

AVALANCHE SIMULATOR PROBLEM "B" *
"SNOW VALLEY"

(D.G.--N.A.--1972)
(Revised by D.G.-1973, 1975)

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*COMPLEX (Multiple-Scene) SETUP

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AVALANCHE SIMULATOR PROBLEM "B" - SNOW VALLEY

By Dale Gallagher and Norm Anderson, 1972
Revised 1973, 1975, by Dale Gallagher

I. OVERALL OBJECTIVE

To strengthen trainees' ability to organize and direct avalanche rescues.

II. BRIEFING OF TRAINEES (Should be held in area separate from Simulator Theater. Provide pencil and paper for notes.)

A. Overall Objective (see I above)

B. How the Problem Will Be Run

1. The problem will involve three trainees who will be training for leadership of the following positions: Rescue Leader; Site Commander; and Dispatcher.

2. Three separate scenes will be used. These are:

   a. Assembly Point - Dispatcher will be here.

   b. General View of Mountainside - Rescue Leader will be here.

   c. At the Avalanche - When Rescue Leader dispatches Site Commander to the accident, Site Commander will be at this scene.

3. Communications will be by radio and/or telephone.

4. Trainees are to remain "in character" throughout the exercise, conducting themselves just as if they were working in a real situation; they must limit their conversation to the exercise, no questions answered, no excessive humor, etc.

5. During the problem, do not assume that anything has been or will be done. Either ask over the communication system or make it known over the communication system that it will be done.

6. When contacting the Rescue Leader, Site Commander, or Dispatcher, address them by their titles, not their names.

*COMPLEX (Multiple-Scene) SETUP

7. Simulator will be new for some of you. You may find yourself under stress and strain. This is realistic, since in actual rescues, you will experience stress and strain. The key is making sound decisions rapidly.

8. We ask that trainees and observers not discuss this exercise with those who have not seen it.

C. Specific Objectives

1. Rescue Leader

In accordance with standard avalanche rescue procedures, give overall direction to a successful implementation of a rescue, including the following:

--Within 10 minutes, dispatch Stage I
--Within 20 minutes, have Stage II dispatched
--Within approximately 1 hour, dispatch Stage III

2. Site Commander

In accordance with standard avalanche rescue procedure:

--Direct rescuers safely to accident site
--Establish areas of highest probability
--Implement actual search work

3. Dispatcher

In accordance with standard avalanche rescue procedure:

--Organize a group of volunteers
--Dispatch people
--Handle other situations that arise at the assembly point

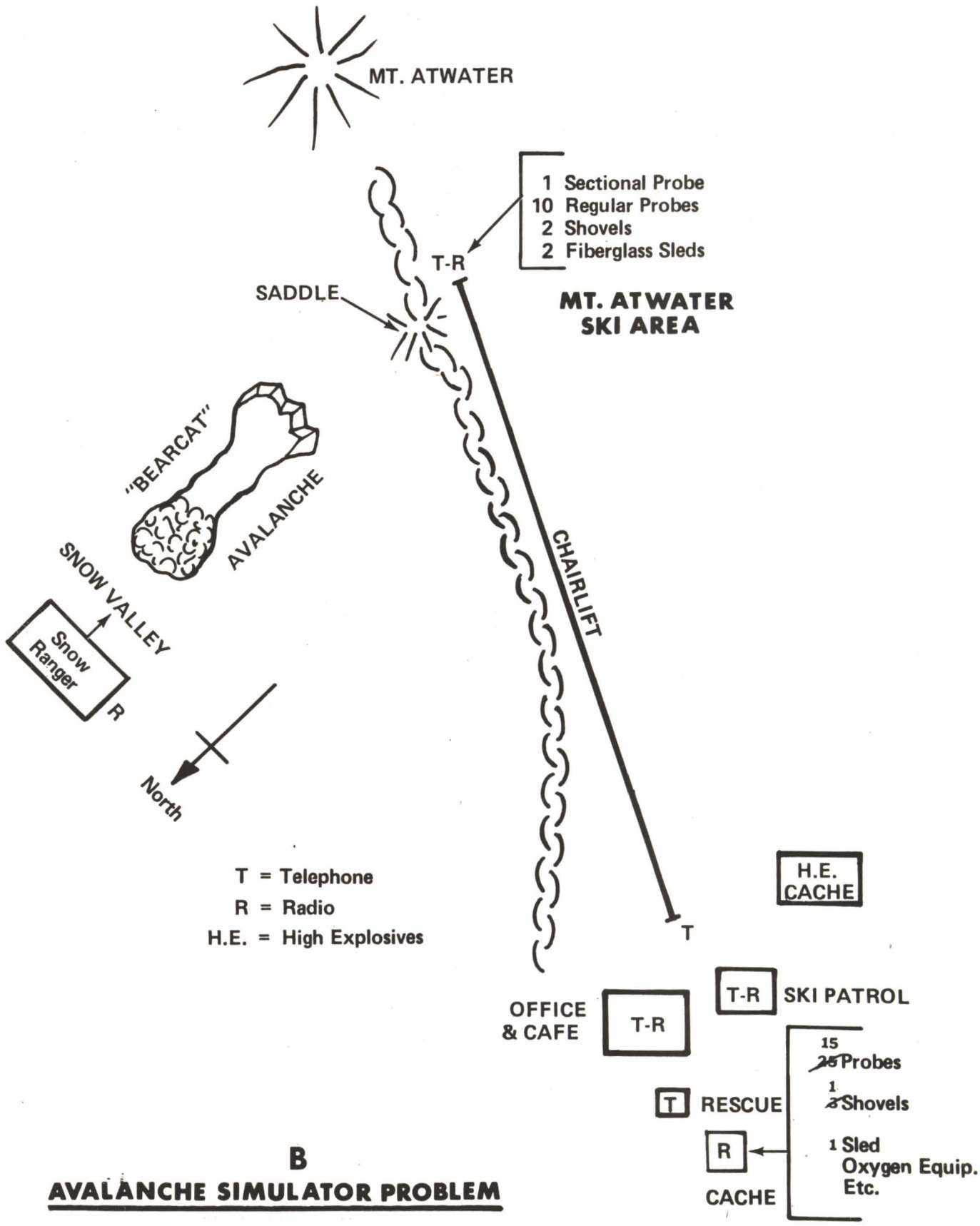
D. Contents of Written Handouts (Give Critique Sheet to observers and Handouts to trainees)

1. Rescue Plan

Cover Sections 1, 2, and 3 of Rescue Plan briefly, using trainee Handout.

2. Orientation

(Review sketch map of exercise and photo of background scene with Rescue Leader and other trainees.)

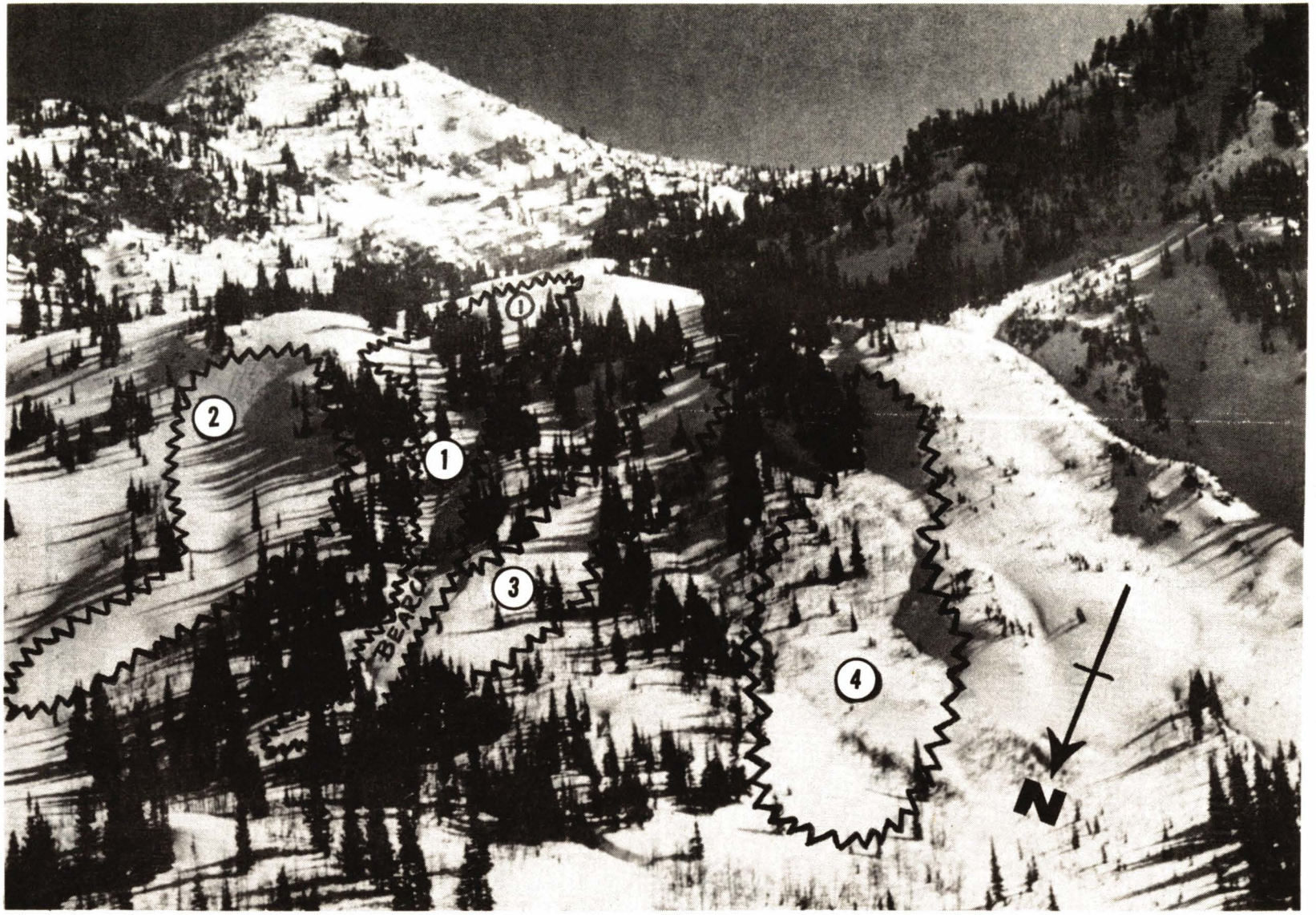


B

AVALANCHE SIMULATOR PROBLEM

("Complex" Exercise)

AVALANCHE SIMULATOR PROBLEM "B"



In addition to "Bearcat" Avalanche, Set up 3 other avalanches on simulator.

E. General Situation (Trainees may want to take notes)

1. Weather

Thursday, March 2 - 8 hours of rain and warm wind, followed by below freezing temperatures.

Friday, March 3 - Continued cold in morning; snow surface has turned to ice. Afternoon brings snow, with winds 10-25 mph.

Saturday, March 4 - Continued snow until late evening. Snowfall Friday and Saturday totaled 18 inches.

Sunday, March 5 (TODAY) - Dawned clear, temperature +19°F. with 5-10 mph winds.

2. List of Volunteers at the Assembly Point (Give only to Dispatcher)

8 - Volunteer ski patrollers (no avalanche training)
12 - Ski instructors
21 - Miscellaneous volunteer skiers

(None of these are qualified to lead groups to the accident scene.)

3. The General Scene and Rescue Leader

An undeveloped area called "Snow Valley," adjacent to the Mount Atwater Ski Development. Chairlift No. 1 goes to the saddle seen in the background (see sketch). The Snow Ranger is out reading snow courses, studying the feasibility of expanding the ski area into this valley. He is alone, due to limited manpower. He has a radio and can contact the Ski Area Manager's Office, the Ski Patrol Room, and the top of Chairlift No. 1.

4. Volunteer Ski Patrol Leader Wheeler

He is skiing and will momentarily reach the bottom of Lift No. 1. He has a radio.

5. Dispatcher (Professional patrolman with leg is walking cast)

He is in the cafeteria. Can be reached by paging on the public address system.

6. Volunteer and Professional Patrol numbers are reduced because some have been dispatched to a rescue 1½ hours away. The leader of the Professional Patrol and the Assistant Volunteer Leader are gone on this rescue. They have taken 10 probe poles and 2 shovels from main cache at base of ski area. Sketch map indicates this reduction in equipment. Trainees may want to also note this on their copy of the rescue plan.

7. The avalanche control team consists of the Assistant Snow Ranger Olson, Assistant Professional Patrol Leader Breen, and Professional Patrolman Fox. They are now doing control work between Lifts #1 and #2 and have radios.

8. A volunteer ski patroller is at the top of both chairlifts. Both patrollers have radios.

9. A telephone is located next to the main rescue cache at the base of the ski area.

10. Snow Valley, where the Snow Ranger is, is inaccessible to snowcats and other over-snow vehicles.

11. To recap for the Rescue Leader, your Site Commander is about to reach the bottom of lift No. 1. He has a radio. Your Dispatcher is in the cafeteria and can be reached by the public address system.

F. Summary

Director says:

1. "Remember, in Avalanche Rescues, TIME means human LIFE."

-Pause-

2. "The leaders will now be guided to their respective areas."

(Site Commander will go to avalanche debris scene where he can hear radio conversations. His scene will not be turned on until he arrives at accident.)

(Dispatcher will go to assembly point area but will hear nothing until Snow Ranger has him paged over public address system. When he arrives at the rescue cache, the assembly scene will be turned on.)

In each of the above, the director of the problem will say, just before the scene is turned on, "You have now arrived at (Location). Your problem has now begun."

G. Final Instructions

After each leader is in position, announce over the public address system for all leaders to hear, "The time is now 1015 hours, Sunday, March 5. Set your watches."

NOTE: In order to train more leaders, the leader of any position can be replaced in the middle of the problem. At the briefing, it can be announced this will be done and that the replacement will be one of the observers. This instills the observers to pay close attention, since anyone may suddenly be called upon as the replacement.

H. Special Instructions to Rescue Leader (over Public Address System--to him only)

"As you were returning from reading the snow courses, you break a ski tip. While trying to repair your ski tip, you see ski tracks from a touring party across the canyon from you and realize they are in avalanche terrain. (Turn on scene. Wait about 1 minute.) As you try to shout to them, you see the two skiers enter Bearcat Avalanche Path. ("Run" the avalanche.) THE PROBLEM HAS BEGUN."

III. ROLE PLAYERS

*Can lead volunteers to accident
(A) Avalanche rescue trained

A. Ski Area Manager Speer* - In ski area office. All announcements made over public address system are made from here.

If control team is requested to shoot paths in Snow Valley, Speer will call Rescue Leader on radio and ask to keep them in ski area until they have finished control work there. Otherwise, some paying customer may get caught.

B. Volunteer Patroller Waldron*(A) - Is at top of Lift No. 1. Has radio. Logical person to take sectional probe and establish safe route to accident under guidance of Rescue Leader. Since Waldron has avalanche training, could serve as Hasty Search Leader or Probe Leader.

If Rescue Leader dispatches him to the accident, Site Commander can be following a few minutes behind.

C. Assistant Snow Ranger Olson*(A) - With control team. Has radio. Will reach bottom of Lift No. 1 about 5-7 minutes after problem starts.

D. Assistant Professional Patrol Leader Breen*(A) - Foreman of avalanche control team. Has radio. Doing control work. Will reach bottom of Lift No. 1 about 5-7 minutes after problem starts. When contacted, the team has enough powder and caps for six shots. Will take 10-15 minutes to get more.

E. Professional Patrolman FOX*(A) - With control team. Will reach bottom of Lift No. 1 about 5-7 minutes after problem starts.

F. Volunteer Patrol Leader WHEELER*(A) - Is skiing, and will momentarily reach the bottom of the chairlift. Could serve as Site Commander or in charge of Stage I.

G. Ski School Director KATTER* - In base area. Can be reached by paging.

H. Assistant Ski School Director LUNDY* - In base area. Can be reached by paging.

I. Volunteer Patroller ALEXANDER - On duty in ski patrol room at base of area but available.

J. Forester REYNOLDS* - Can be reached by paging.

K. Hasty Search Crew (as appointed) - Requests instructions on last seen point, where to probe, where to search, etc., and may report finding some clues.

L. Man Running the Probe Line (as appointed) - Requests escape route for those working for him, if not established by the Rescue Leader. Also requests location where probe line should be set up.

M. Group Leaders - Per Rescue Plan, they are available by radio or telephone to lead groups of rescuers to the accident site. They are anxious to get to the accident--become impatient over any delays.

N. Radio Station Reporter HARRY HOLLINGSHEAD, KSKI - At top of Lift No. 1, on snowshoes, calls by radio, wants instructions on how to get to this "terrible accident." Wants to get statements from those working right at the scene. If they keep Hollingshead from coming to the scene, he can call back later and complain--inefficient rescue, still some ski patrolmen at ski area, etc., etc.

O. District Ranger NORLIN from adjoining National Forest - Calls Dispatcher on phone and requests more men and probes for the other avalanche accident.

P. Operator, Top Lift No. 1, ROSEBARY - Calls on radio. A touring party has asked instructions how to get to the top of Mt. Atwater. He warned them about avalanche danger, but they are getting ready to go anyway.

Q. Helicopter - If requested while he is enroute to area, he has to make emergency landing and one passenger needs medical aid.

R. Miscellaneous

Doctor Emmrich (available by phone)

Sheriff Powell (available by phone)

NOTE: Professional Patrol Leader and Assistant Volunteer Patrol Leader Morris have gone to other avalanche rescue. Not available.

IV. MASTER SCRIPT

A. Rescue Leader (Oblique of Accident Scene)

1. Objective

In accordance with standard avalanche rescue procedures, give overall direction to a successful completion of the rescue.

2. General Situation

The Rescue Leader (Snow Ranger) is unable to move because of his broken ski tip. He must direct operations from this point. The weather indicates serious avalanche hazard. This is substantiated by the fact that an avalanche has caught some other people in an adjacent National Forest, and some patrolmen and equipment have been sent to that accident. Normal procedure would be to check with explosives the avalanche paths adjacent to Bearcat Avalanche before the main groups of rescuers arrive. Safe route could be established from saddle to fracture line of Bearcat Avalanche. Rescue Leader should dispatch Site Commander to accident scene.

The Rescue Leader will need to coordinate the overall rescue operation and insure that the standard procedures are implemented without omissions.

3. Correct Sequence and Decisions, Possible Incorrect Actions, and Feedback Methods

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Call base area. State situation and freeze all rescue personnel.	Does not freeze personnel.	Key people will be riding lift or "somewhere in base area."
	Does not state situation.	Area Manager questions his needs.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Contact Site Commander by radio. Give directions to accident. Order him : (1) Appoint a dispatcher, (2) bring in "Stage I" via Lift I, (3) Contact Control Team--have them proceed to top of Lift I as soon as possible, and (4) Contact Rescue Leader when he reaches top of Lift I.	Does not contact Site Commander.	Site Commander calls him on radio.
	Does not order "Stage I."	Site Commander checks back to see if he needs "Stage I" equipment.
	Does not appoint dispatcher.	Volunteers meet but are confused as to what to do. Call Rescue Leader on radio.
	Does not give instructions for Control Team.	They go to top of Lift I but without explosives.
Notify Area Manager of situation and have him check with Dispatcher to see that others are notified.	Does not notify Area Manager.	Calls Rescue Leader and wants to know what is going on.
Contacts Dispatcher to insure rescue plan being followed--notification, dispatch of "Stage II," etc.	Does not double check on notification.	Sheriff calls--says he has heard rumor of another avalanche.
	Does not check on dispatch of "Stage II."	Dispatcher has "Stage II" together--waiting further instructions.
Contact Site Commander when he reaches top of Lift I to discuss safe route to accident scene.	Site Commander takes poor route.	Must retrace some of his tracks.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Site Commander marks safe route into accident area.	Does not mark route.	Next party gets confused between rescuers' tracks and recreational skiers' tracks.
		Next party gets caught in another avalanche.
Insures posting of avalanche guard and establishment of escape routes.	No guard posted.	Second slide nearly buries some of rescuers.
	No escape route.	Second slide causes confusion--some rescuers call and do not want to go back in area.
Utilize Control Team to reduce serious hazard areas prior to letting rescuers in.	Forgets Control Team.	Second slide runs. Control Team calls and offers their services.
Calls Site Commander and establishes last seen point.	Last seen point not established.	Hasty-Search Leader calls and says he is looking at top of avalanche (at fracture line).
Checks back with Dispatcher to see if any problems there.	Does not check back.	Dispatcher calls to learn what is going on.
Checks with Site Commander to be sure Hasty Search and Coarse Probe are underway.	Does not check.	Delay in getting search and/or probe set up. Probe-line worker calls up and complains.
Checks with Dispatcher to see how he is coming in organizing "Stage III."	Does not check.	Area Manager calls and wonders if they shouldn't be getting "Stage III" together.
Coarse probing covers areas of highest probability and "Stage II" is on way or arrives.	—	Conclude exercise.

4. Special Visual Effects

a. Set up four avalanches, as shown on attached diagram, using two transparencies. This gives the latitude of allowing an avalanche to run on either side if a mistake is made on route finding or if explosives are improperly placed.

The "smoke" (white) projector of the simulator is used to simulate the running avalanche.

b. Make ski tracks on acetate overlay on lower platform, down maximum. This is needed so that Rescue Leader can establish last seen point.

c. Shot holes for explosives (use felt-tip on acetate on the lower or upper platform). Raise the platform 1 to 1½ inches.

5. Special Sound Effects

a. High explosives

b. Helicopter

c. Wind

6. Potential Emergency Inputs

See Section III, Role Players.

B. Site Commander (and/or Probe-Line Leader)(Avalanche Debris Scene)

1. Objective

In accordance with standard avalanche rescue procedure:

--Establish areas of highest probability
--Implement actual search work

2. General Situation

The avalanche debris scene will not be activated until the Site Commander reaches the accident. As he arrives, an announcement will be made over the public address (only to this scene), "You have now arrived at the accident scene. Your problem has begun," and the scene will be turned on.

The Site Commander will need to establish the last seen point, organize the hasty search, organize the coarse probing, and discuss an avalanche guard and escape route with the Rescue Leader.

3. Correct Sequence and Decisions, Possible Incorrect Actions, and Feedback Methods

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Contact Rescue Leader for instructions.	Does not contact Rescue Leader.	Area Manager calls and tells him Rescue Leader wants to talk to him.
Appoint Dispatcher for assembly point.	Does not appoint Dispatcher.	Volunteers call him on radio--are at assembly point but confused as to what to do.
Get volunteers and bring them and "Stage I" pack either from base or top of Lift I. Could dispatch ski patrolmen from top Lift I with "Stage I" pack from there.	Forgets "Stage I" equipment.	Dispatcher calls and reminds him to get "Stage I" equipment from top Lift I.
Contact Control Team to bring 6-8 charges to top of Lift I.	Forgets to contact Control Team.	Control Team calls from top of Lift I--without explosives.
Contact Rescue Leader from top of Lift I; re: safe route in.	Does not contact Rescue Leader.	Gets caught but not hurt in small avalanche.
Marks safe route into accident area.	Does not mark route or have someone do it.	Next party gets confused between rescuers' tracks and recreational skiers' tracks.
		Next party gets caught in another avalanche.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Posts avalanche guard and establishes escape route.	No guard posted.	Second slide nearly buries some of rescuers.
	No escape route.	Second slide causes confusion--some rescuers call and do not want to go back into area.
Establishes last seen point by talking to Rescue Leader.	Last seen point not established.	Hasty Search looks in wrong place--near fracture line.
Maintains control and sets up "Coarse" and later "Fine" probe lines.	Does not give good leadership.	Probers rebel and call Rescue Leader on radio.
Coarse probing covers areas of highest probability and "Stage II" is on way or arrives.	---	Conclude exercise.

4. Special Visual Effects

a. Use a black X for the last seen point (on acetate on lower platform, almost all the way down).

b. Use felt marker on acetate overlays for the flags and probed areas.

(1) Flags delineating area probed--use red acetate marker on the bottom platform almost all the way down.

(2) Probed area--use blue acetate marker on upper platform 5 or 6 inches from transparency. This will be about as low as you can get it. Draw parallel lines approximately 1/8 inch apart to make a lightly shaded blue area delineating the area probed.

By using two transparencies, the flagged and probed area can be advanced by lap-dissolve as the probing actually takes place.

5. Special Sound Effects

   a. Instructions to probers by the Probe-Line Leader; i.e., insert probe and advance, insert probe and advance, etc.

6. Potential Emergency Inputs

   See Section III, Role Players.

C. Dispatcher (Assembly Area Scene)

1. Objective

   In accordance with standard avalanche rescue procedure:

   --Organize a group of volunteers
   --Dispatch people
   --Handle other situations that arise at the assembly point

2. General Situation

   The scene will not be activated until the Rescue Leader asks for a page of the Dispatcher (a professional patrolman with leg in walking cast) and the Dispatcher has had time to get to the rescue cache (2-3 minutes travel time). When he arrives, announce over his public address system, "You have now arrived at the assembly point. YOUR PROBLEM HAS NOW BEGUN."

   The Dispatcher must gather leaders from those listed on the rescue plan, get them to the assembly points, and dispatch the volunteers in groups. He needs to keep the Rescue Leader informed and handle other situations that the Role Players will give him.

3. Correct Sequence and Decisions, Possible Incorrect Actions, and Feedback Methods

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Check in with Rescue Leader for instructions.	Does not check in.	Ski Patrol Leader calls to find out what is going on.
Notify Area Manager, ski patrol room, lift operators of emergency.	Does not notify.	They call Dispatcher to find out what is going on.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Assist Site Commander in dispatching "Stage I."	Does not become involved with "Stage I."	Part of "Stage I" equipment left behind.
Lines up manpower of for last of "Stage I" equipment and for "Stage II."	Fails to line up people.	Doctor calls and wonders if he is needed.
Handle curious people and other problems that arise.	Passes problems on to Rescue Leader or Site Commander.	Newsman, sheriff, etc., call Rescue Leader or Site Commander and cause problems.
Keeps Rescue Leader informed and up-to-date on his actions.	Does not keep Rescue Leader informed.	Area Manager begins taking over dispatching job because it does not seem to be getting done.
"Stage II" dispatched and "Stage III" organization well underway.	---	Conclude exercise.

4. Special Visual Effects

   a. Use overhead projector for this scene.

   b. No other special effects.

5. Special Sound Effects

   a. Crowd

   b. Ski area music, occasionally interrupted by miscellaneous ski area announcements.

6. Potential Emergency Inputs

   See Section III, Role Players.

V. DEBRIEFING

Key Points to Critique:

A. Rescue Leader

1. Did he give directions to Dispatcher on how to reach the site?

2. Does he follow the organizing and dispatching of volunteers and leaders from the assembly point?

3. Does he follow up to see that all persons are notified who are supposed to be?

4. Does he insure that the area surrounding the accident is made safe prior to letting rescuers enter the area?

5. Does he give directions for a safe route into the accident area?

6. Is "last seen" point established?

7. Is an avalanche guard posted?

8. Does he establish or order the Site Commander to establish an escape route for the rescuers?

9. Does he insure that the hasty search and probe lines are properly set up?

B. Site Commander and/or Probe-Line Leader

1. Did he establish last seen point?
2. Did he establish escape route?
3. Did he post lookout?
4. Did he analyze the areas of highest probablility?
5. Did he organize hasty search?
6. Did he organize probe line?

C. Dispatcher

1. Did he check to see that the volunteers were properly equipped and clothed?

2. Did he dispatch a small group right away, as soon as the first leader arrived?

3. Did he dispatch other in groups as soon as leaders available?

4. How does he handle the other situations that arise?

D. General

Remind trainees and observers not to discuss this exercise with those who have not seen it.

((HANDOUT FOR TRAINEE))

Avalanche Simulator Problem "B"*
(At end of problem, return this to Simulator Team)

MOUNT ATWATER SKI AREA //RESCUE PLAN//

1. IN CASE OF AVALANCHE ACCIDENT, NOTIFY THE FOLLOWING:

Snow Ranger
Assistant Snow Ranger
Professional and Volunteer Ski Patrol Leaders and/or Assistants
Sheriff Powell
Forest Supervisor
Dr. Emmrich

Assemble volunteers at main rescue cache at base of ski area.

2. Equipment

--Rescue Caches

a. Base of Ski Area - 25 probe poles, 3 shovels, 1 fiberglass sled, oxygen equipment, and other standard avalanche rescue cache equipment.

b. Top of Both Chairlifts - Each cache has: 1 sectional probe, 10 regular probes, 2 shovels, 2 fiberglass sleds.

--Miscellaneous

High explosives and caps near base of lifts
Two large snowcats
One snowmobile
Three-Place Helicopter--Capacity=Pilot and 2 passengers
(45 minutes away)

--Communications

Telephone
- One at Ski Patrol Room
- One at Ski Area Manager's Office
- One next to Rescue Cache at base of ski area
- One at bottom and top of both chairlifts

Radios
- Box of 15 in rescue cache at base of ski area
- One in upper terminal of both chairlifts
- One in Ski Area Manager's Office
- One in Ski Patrol Room

Public Address System throughout base of ski area

*COMPLEX (Multiple-Scene) SETUP

3. Manpower - You have the following manpower usually available to you:

Forest Service--
*Snow Ranger (A)
*Asst. Snow Ranger Olson (A)
*Forester Reynolds

Ski Area Personnel--
*Manager Speer

Ski School Instructors--
*Director Katter
*Asst. Director Lundy
Other Instructors
(Total of 12) (* - 2)

Dr. Emmrich

Sheriff Powell

Professional Ski Patrol--
*Patrol Leader Peak (A)
*Asst. Leader Breen (A)
(Foreman, Avalanche Control Team)
*Patrolman Fox (A)
(Member, Avalanche Control Team)
One other patrolman
(Leg in cast)

Volunteer Ski Patrol--
*Patrol Leader Wheeler (A)
*Asst. Leader Morris (A)
*Patroller Waldron (A)
*Patroller Alexander
Other Ski Patrollers
(Total of 8)

Note: You may want to mark the locations of these people on your sketch map.

* Can be used to lead volunteers to back-country accidents.

(A) Trained in avalanche rescue.

((HANDOUT FOR TRAINEE))

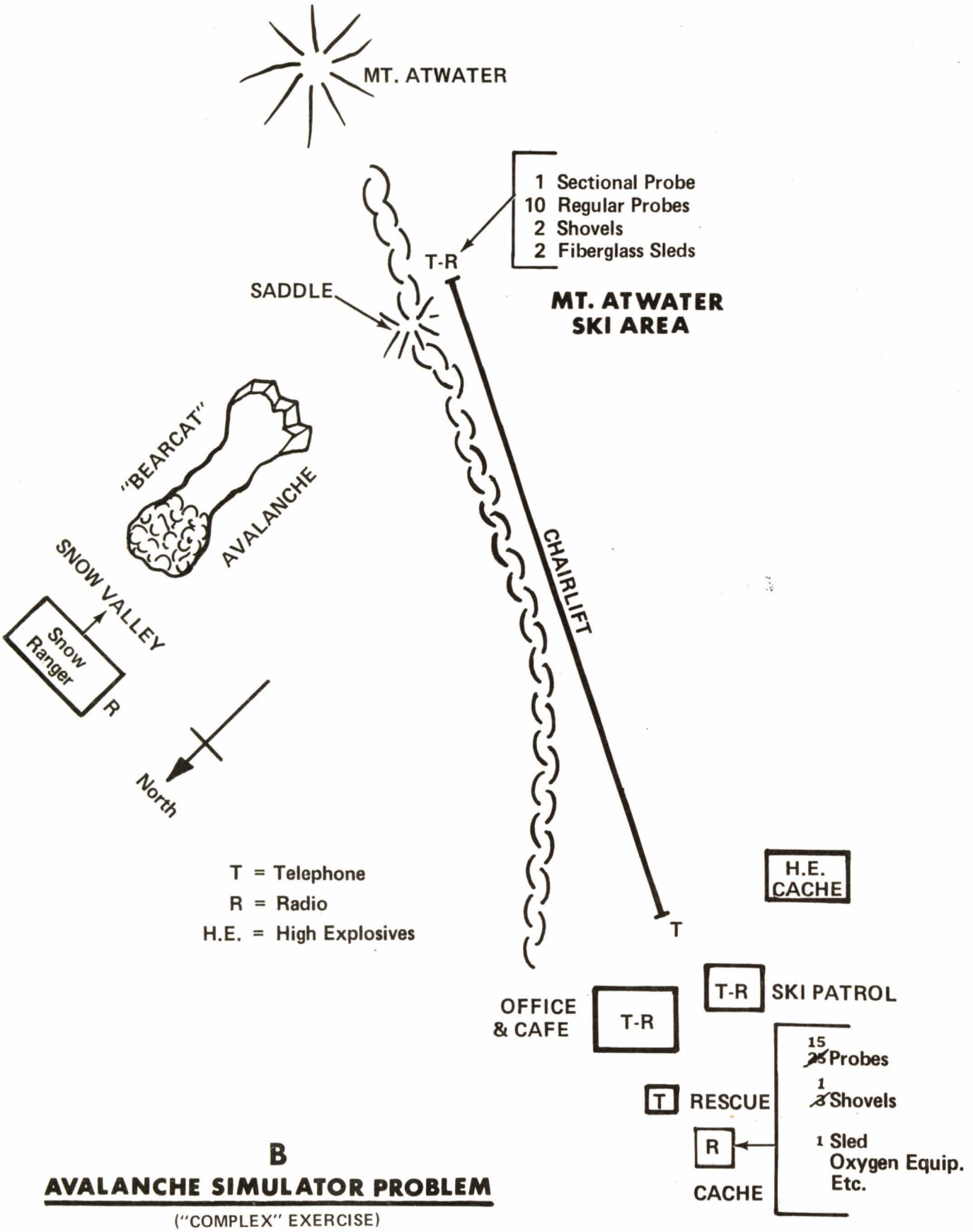
WEATHER INFORMATION

Thursday, March 2 - 8 hours of rain and warm wind, followed by below freezing temperatures.

Friday, March 3 - Continued cold in morning; snow surface has turned to ice. Afternoon brings snow, with winds 10-25 m.p.h.

Saturday, March 4 - Continued snow until late evening. Snowfall Friday and Saturday totaled 18 inches.

Sunday, March 5 (TODAY) - Dawned clear, temperature +19° F. with 5-10 m.p.h. winds.



B

AVALANCHE SIMULATOR PROBLEM

("COMPLEX" EXERCISE)

(5) (B)

LIST OF VOLUNTEERS AT THE ASSEMBLY POINT (Give only to Dispatcher)

8 – Volunteer ski patrollers (no avalanche training)
12 – Ski instructors
21 – Miscellaneous volunteer skiers

(None of these are qualified to lead groups to the accident scene.)

SAMPLE EXERCISE "C" (Simple)

- BRIEFING
- MASTER SCRIPT
- DEBRIEFING
- HANDOUTS FOR TRAINEE

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SAMPLE EXERCISE "C" (Simple)

- BRIEFING
- MASTER SCRIPT
- DEBRIEFING
- HANDOUTS FOR TRAINEE

AVALANCHE SIMULATOR PROBLEM "C" *
"SNOW VALLEY"

(D.G.--N.A.--1972)
(Revised by D.G.-1973, 1975)

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	H. Ski School Director Katter----------	C-4
	I. Assistant Ski School Director Lundy----------	C-5
	J. Forester Reynolds----------	C-5
	K. Hasty Search Crew----------	C-5
	L. Man Running the Probe Line----------	C-5
	M. Group Leaders----------	C-5
	N. Radio Station Reporter Harry Hollingshead----------	C-5
	O. District Ranger Norlin----------	B-6
	P. Operator, Top of Chairlift, Rosebary----------	C-5
	Q. Helicopter----------	C-5
	R. Miscellaneous----------	C-5

*SIMPLE (Single-Scene) SETUP

AVALANCHE SIMULATOR PROBLEM "C" - SNOW VALLEY*

By Dale Gallagher and Norm Anderson, 1972
Revised 1973, 1975 by Dale Gallagher

I. OVERALL OBJECTIVE

To strengthen trainees' ability to organize and direct avalanche rescues.

II. BRIEFING OF TRAINEE(S) (Should be held in area separate from Simulator Theater. Provide pencil and paper for notes.)

A. Overall Objective (see I. above)

B. How the Problem Will Be Run

1. The problem will involve a trainee(s) who will be training for rescue leader.

2. The scene will be a general view of a mountainside.
3. Communications will be by radio and/or telephone.

4. Trainee(s) is to remain "in character" throughout the exercise, conducting himself just as if he were working in a real situation; he must limit his conversation to the exercise, no questions answered, no excessive humor, etc.

5. During the problem, do not assume that anything has been or will be done. Either ask over the communication system or make it known over the communication system that it will be done.

6. When contacting the Rescue Leader, Site Commander, or Dispatcher, address them by their titles, not their names.

7. Simulator will be new for some of you. You may find yourself under stress and strain. This is realistic, since in actual rescues you will experience stress and strain. The key is making sound decisions rapidly.

8. We ask that trainees and observers not discuss this exercise with those who have not seen it.

*SIMPLE (Single-Scene) SETUP

C. Specific Objectives

1. Rescue Leader

In accordance with standard avalanche rescue procedures, give overall direction to a successful implementation of a rescue, including the following:

--Within 10 minutes, dispatch Stage I
--Within 20 minutes, have Stage II dispatched
--Within approximately 1 hour, dispatch Stage III

D. Contents of Written Handouts (Give Critique Sheet to observers and Handouts to trainees. It is often desirable to give Handouts to trainees several hours in advance.)

1. Rescue Plan

Cover Sections 1, 2, and 3 of Rescue Plan briefly, using trainee Handout.

2. Orientation

(Review sketch map of exercise and photo of background scene with Rescue Leader)

E. General Situation (Trainees may want to take notes)

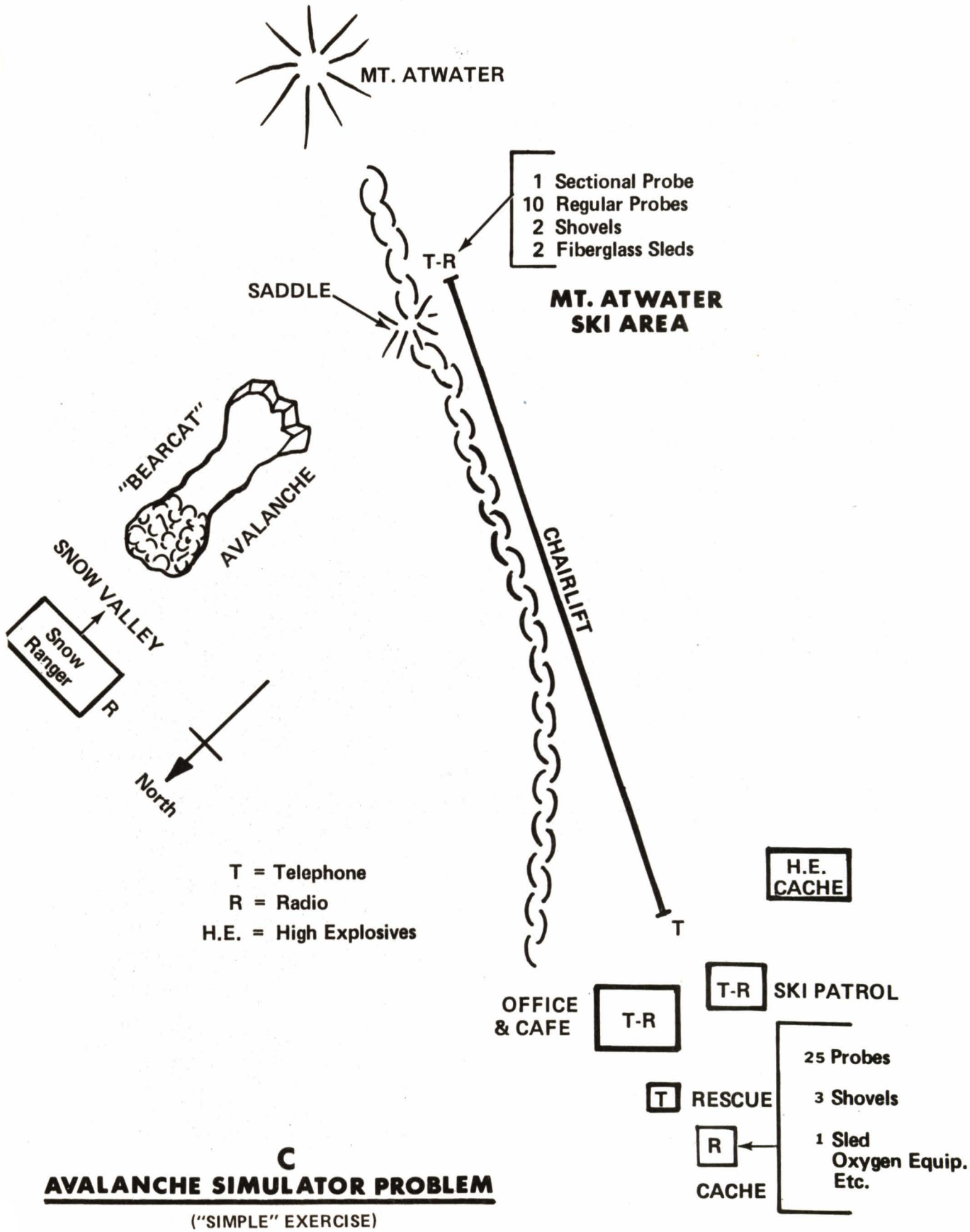
1. Weather and Snow Conditions

Ice layer with 18 inches of new snow. Storm had consistent winds from 10-25 mph. Today, (Sunday, March 5), is clear, some light wind, and a temperature of +19°F.

2. The General Scene and Rescue Leader

An undeveloped area called "Snow Valley," adjacent to the Mount Atwater Ski Development. A chairlift goes to the saddle seen in the background (see sketch). The Snow Ranger is out reading snow courses, studying the feasibility of expanding the ski area into this valley. He is alone, due to limited manpower. He has a radio and can contact the Ski Area Manager's Office, the Ski Patrol Room, and the top of the chairlift.

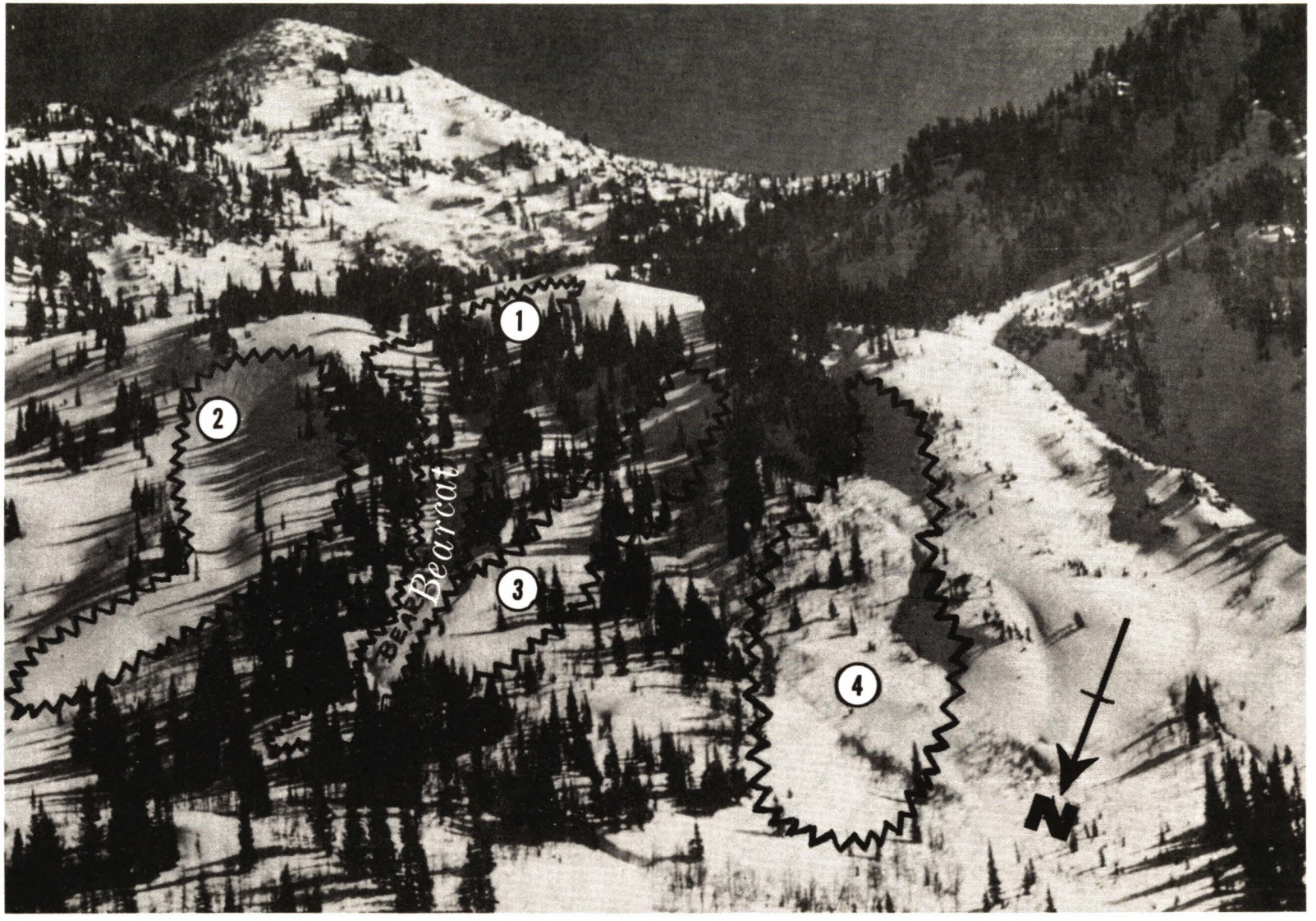
Continued--



C
AVALANCHE SIMULATOR PROBLEM

("SIMPLE" EXERCISE)

AVALANCHE SIMULATOR PROBLEM "C"



In addition to "Bearcat" Avalanche, Set up 3 other avalanches on Simulator.

3. Volunteer Ski Patrol Leader Wheeler

He is skiing and will momentarily reach the bottom of the chairlift. He has a radio.

4. The Leader of the Professional Patrol (Peak) and the Assistant Volunteer Leader are in the Patrol Room.

5. An Avalanche Control Team (consisting of the Assistant Snow Ranger (Olson), the Assistant Professional Patrol Leader (Breen), and Professional Patrolman (Fox) is now doing control work and will soon reach the bottom of the chairlift.

6. A volunteer ski patroller (Waldron) is at the top of the chairlift. He has a radio.

7. A telephone is located next to the main rescue cache at the base of the ski area.

8. Snow Valley, where the Snow Ranger is, is inaccessible to snowcats and other over-snow vehicles.

9. To recap for the Rescue Leader, the Volunteer Patrol Leader is about to reach the bottom of the chairlift. He has a radio. The avalanche control team is now doing control work. They have radios and will soon reach the bottom of the chairlift.

F. Summary

Director says:

1. "Remember, in Avalanche Rescues, TIME means human LIFE."

-Pause-

2. "The Rescue Leader will now be guided to the training area."

G. Final Instructions

After the leader is in position, announce over the Public Address System, "The time is now 1015 hours, Sunday, March 5. Set your watch."

Note: In order to train more leaders, the leader can be replaced in the middle of the problem. At the briefing, it can be announced this will be done and that the replacement will be one of the observers. This instills the observers to pay close attention, since anyone may suddenly be called upon as the replacement.

H. Special Instructions to Rescue Leader (over Public Address System)

"As you were returning from reading the snow courses, you break a ski tip. While trying to repair your ski tip, you see ski tracks from a touring party across the canyon from you and realize they are in avalanche terrain. (Turn on scene. Wait about 1 minute.) As you try to shout to them, you see the two skiers enter Bearcat Avalanche Path. ("Run" the avalanche.) THE PROBLEM HAS BEGUN."

III. ROLE PLAYERS

* Can lead volunteers to accident
(A) Avalanche rescue trained

A. Ski Area Manager SPEER* - In ski area office. All announcements made over Public Address System are made from here.

If control team is requested to shoot paths in Snow Valley, Speer will call Rescue Leader on radio and ask to keep them in ski area until they have finished control work there. Otherwise, some paying customer may get caught.

B. Volunteer Patroller WALDRON*(A) - Is at top of the chairlift. Has radio. Logical person to take sectional probe and establish safe route to accident under guidance of Rescue Leader. Since Waldron has avalanche training, could serve as Hasty Search Leader of Probe Leader.

C. Assistant Snow Ranger OLSON*(A) - With control team. Has radio. Will reach bottom of chairlift about 5-7 minutes after problem starts.

D. Assistant Professional Patrol Leader BREEN (A) - Foreman of avalanche control team. Has radio. Doing control work. Will reach bottom of chairlift about 5-7 minutes after problem starts. When contacted, the team has enough powder and caps for six shots. Will take 10-15 minutes to get more.

E. Professional Patrolman FOX*(A) - With control team. Will reach bottom of chairlift about 5-7 minutes after problem starts.

F. Volunteer Patrol Leader WHEELER*(A) - Is skiing, and will momentarily reach the bottom of the chairlift. Could serve as Site Commander or in charge of Stage I.

G. Professional Patrol Leader PEAK*(A),
Assistant Volunteer Leader MORRIS*(A),
Volunteer Patroller ALEXANDER* -

All on duty in Patrol Room. Other patrolmen skiing on mountain unless noted above.

H. Ski School Director KATTER* - In base area. Can be reached by paging.

I. Assistant Ski School Director LUNDY* - In base area. Can be reached by paging.

J. Forester REYNOLDS* - Can be reached by paging.

K. Hasty Search Crew (as appointed) - Requests instructions on last seen point, where to probe, where to search, etc., and may report finding some clues.

L. Man Running the Probe Line (as appointed) - Requests escape route for those working for him, if not established by the Rescue Leader. Also requests location where probe line should be set up.

M. Group Leaders - Per Rescue Plan, they are available by radio or telephone to lead groups of rescuers to the accident site. They are anxious to get to the accident--become impatient over any delays.

N. Radio Station Reporter HARRY HOLLINGSHEAD, KSKI - At top of chairlift on snowshoes, calls by radio, wants instructions on how to get to this "terrible accident." Wants to get statements from those working right at the scene. If they keep Hollingshead from coming to the scene, he can call back later and complain--inefficient rescue, still some ski patrolmen at ski area, etc., etc.

O. District Ranger NORLIN from adjoining National Forest - Calls Dispatcher on phone and requests more men and probes for the other avalanche accident.

P. Operator, Top of Chairlift, ROSEBARY - Calls on radio. A touring party has asked instructions how to get to the top of Mt. Atwater. He warned them about avalanche danger, but they are getting ready to go anyway.

Q. Helicopter - If requested while he is enroute to area, he has to make emergency landing and one passenger needs medical aid.

R. Miscellaneous

Doctor Emmrich (available by phone)

Sheriff Powell (available by phone)

IV. MASTER SCRIPT

Rescue Leader (Oblique of Accident Scene)

A. Objective

In accordance with standard avalanche rescue procedures, give overall direction to a successful completion of a rescue, including the following:

--Within 10 minutes, dispatch Stage I
--Within 20 minutes, have Stage II dispatched
--Within approximately 1 hour, dispatch Stage III

B. General Situation

The Rescue Leader (Snow Ranger) is unable to move because of his broken ski tip. He must direct operations from this point. The weather indicates serious avalanche hazard. This is substantiated by the fact that an avalanche has caught some other people in an adjacent National Forest, and some patrolmen and equipment have been sent to that accident. Normal procedure would be to check with explosives the avalanche paths adjacent to Bearcat Avalanche before the main groups of rescuers arrive. Safe route could be established from saddle to fracture line of Bearcat Avalanche. Rescue Leader should dispatch Site Commander to accident scene.

The Rescue Leader will need to coordinate the overall rescue operation and insure that the standard procedures are implemented without omissions.

C. Correct Sequence and Decisions, Possible Incorrect Actions, and Feedback Methods

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Call base area. State situation and freeze all rescue personnel.	Does not freeze personnel.	Key people will be riding lift or "somewhere in base area."
	Does not state situation.	Area Manager questions his needs.
Appoint Site Commander by radio. Give directions to accident. Order him : (1) Appoint a dispatcher, (2) bring in "Stage I" chairlift (3) Contact Control Team--have them proceed to top of chairlift as soon as possible, and (4) Contact Rescue Leader when he reaches top of Lift I.	Does not contact Site Commander.	Volunteer Patrol Leader calls him on radio.
	Does not order "Stage I."	Site Commander checks back to see if he needs "Stage I" equipment.
	Does not appoint dispatcher.	Volunteers meet but are confused as to what to do. Call Rescue Leader on radio.
	Does not give instructions for Control Team.	They go to top of chairlift but without explosives.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Notify Area Manager of situation and have him check with Dispatcher to see that others are notified.	Does not notify Area Manager.	Calls Rescue Leader and wants to know what is going on.
Contacts Dispatcher to insure rescue plan being followed--notification, dispatch of "Stage II," etc.	Does not double check on notification.	Sheriff calls--says he has heard rumor of another avalanche.
	Does not check on dispatch of "Stage II."	Dispatcher has "Stage II" together--waiting further instructions.
Contact Site Commander when he reaches top of Lift I to discuss safe route to accident scene.	Site Commander takes poor route.	Must retrace some of his tracks.
Requests Site Commander to mark safe route into accident area.	Does not request marking of safe route	Next party gets confused between rescuers' tracks and recreational skiers' tracks.
		Next party gets caught in another avalanche.
Insures posting of avalanche guard and establishment of escape routes.	No guard posted.	Second slide nearly buries some of rescuers.
	No escape route.	Second slide causes confusion--some rescuers call and do not want to go back in area.
Utilize Control Team to reduce serious hazard areas prior to letting rescuers in.	Forgets Control Team.	Second slide runs. Control Team calls and offers their services.

Correct Sequence and Decisions	Possible Incorrect Actions	Feedback Methods
Calls Site Commander and establishes last seen point.	Last seen point not established.	Hasty-Search Leader calls and says he is looking at top of avalanche (at fracture line).
Checks back with Dispatcher to see if any problems there.	Does not check back.	Dispatcher calls to learn what is going on.
Checks with Site Commander to be sure Hasty Search and Coarse Probe are underway.	Does not check.	Delay in getting search and/or probe set up. Probe-line worker calls up and complains.
Checks with Dispatcher to see how he is coming in organizing "Stage III."	Does not check.	Area Manager calls and wonders if they shouldn't be getting "Stage III" together.
Coarse probing covers areas of highest probability and "Stage II" is on way or arrives.	—	Conclude exercise.

D. Special Visual Effects

1. Set up four avalanches, as shown on attached diagram, using two transparencies. This gives the latitude of allowing an avalanche to run on either side if a mistake is made on route finding or if explosives are improperly placed.

   The "smoke" (white) projector of the simulator is used to sim late the running avalanche.

2. Make ski tracks on acetate overlay on lower platform, down maximum. This is needed so that Rescue Leader can establish last seen point.

3. Shot holes for explosives (use felt-tip on acetate on the lower or upper platform). Raise the platform 1 to 1½ inches.

E. Special Sound Effects

1. High explosives
2. Helicopter
3. Wind

F. Potential Emergency Inputs

See Section III, Role Players.

V. DEBRIEFING--Key Points to Critique, Rescue Leader

1. Did he give directions to Dispatcher on how to reach the site?

2. Does he follow the organizing and dispatching of volunteers and leaders from the assembly point?

3. Does he follow up to see that all persons are notified who are supposed to be?

4. Does he insure that the area surrounding the accident is made safe prior to letting rescuers enter the area?

5. Does he give directions for a safe route into the accident area?

6. Is "last seen" point established?

7. Is an avalanche guard posted?

8. Does he establish or order the Site Commander to establish an escape route for the rescuers?

9. Does he insure that the hasty search and probe lines are properly set up?

10. Remind trainees and observers not to discuss this exercise with those who have not seen it.

((HANDOUT FOR TRAINEE))

Avalanche Simulator Problem "C"* - Snow Valley
(At end of problem, return this to Simulator Team)

MOUNT ATWATER SKI AREA //RESCUE PLAN//

1. IN CASE OF AVALANCHE ACCIDENT, NOTIFY THE FOLLOWING:

Snow Ranger
Assistant Snow Ranger
Professional and Volunteer Ski Patrol Leaders and/or Assistants
Sheriff Powell
Forest Supervisor
Dr. Emmrich

Assemble volunteers at main rescue cache at base of ski area.

2. Equipment

--Rescue Caches

a. Base of Ski Area - 25 probe poles, 3 shovels, 1 fiberglass sled, oxygen equipment, and other standard avalanche rescue cache equipment.

b. Top of Both Chairlifts - Each cache has: 1 sectional probe, 10 regular probes, 2 shovels, 2 fiberglass sleds.

--Miscellaneous

High explosives and caps near base of lifts
Two large snowcats
One snowmobile
Three-Place Helicopter--Capacity=Pilot and 2 passengers
(45 minutes away)

--Communications (These are noted on sketch map.)

Telephone
- One at Ski Patrol Room
- One at Ski Area Manager's Office
- One next to Rescue Cache at base of ski area
- One at bottom and top of the chairlift

Radios
- Box of 15 in rescue cache at base of ski area
- One in upper terminal of the chairlift
- One in Ski Area Manager's Office
- One in Ski Patrol Room

Public Address System throughout base of ski area

*SIMPLE (Single-Scene) SETUP

3. Manpower - You have the following manpower available to you:

Forest Service--
*Snow Ranger (A)
*Asst. Snow Ranger Olson (A)
*Forester Reynolds

Ski Area Personnel--
*Manager Speer

Ski School Instructors--
*Director Katter
*Asst. Director Lundy
Other Instructors
(Total of 12) (* - 2)

Dr. Emmrich

Sheriff Powell

Professional Ski Patrol--
*Patrol Leader Peak (A)
*Asst. Leader Breen (A)
(Foreman, Avalanche Control Team)
*Patrolman Fox (A)
(Member, Avalanche Control Team)
One other patrolman
(Leg in cast)

Volunteer Ski Patrol--
*Patrol Leader Wheeler (A)
*Asst. Leader Morris (A)
*Patroller Waldron (A)
*Patroller Alexander
Other Ski Patrollers
(Total of 3)

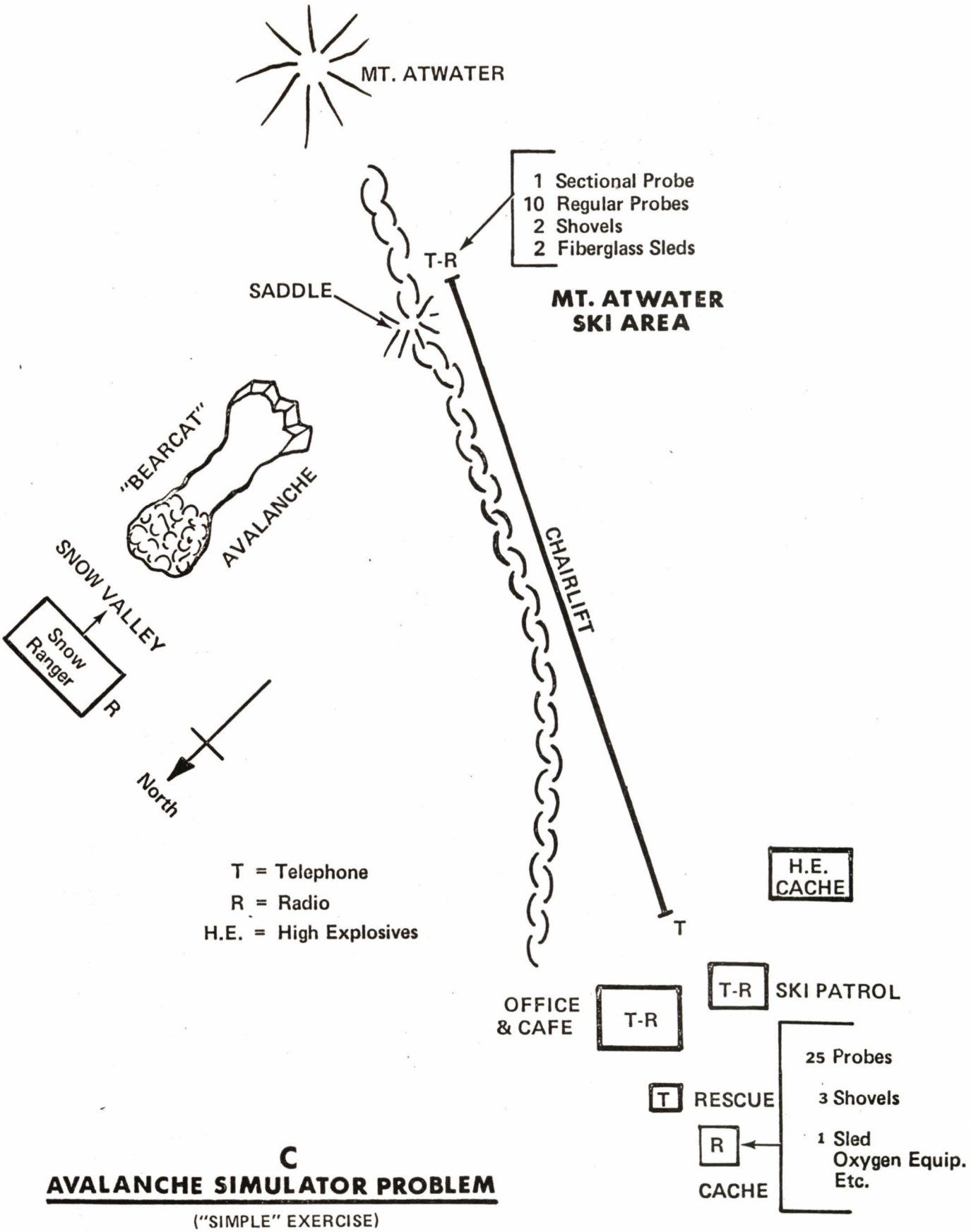
Note: You may want to mark the locations of these people on your sketch map.

* Can be used to lead volunteers to back-country accidents.

(A) Trained in avalanche rescue.

WEATHER AND SNOW INFORMATION

Ice layer with 18 inches of new snow. Storm had consistent winds from 10-25 mph. Today (Sunday, March 5), is clear, some light wind, and a temperature of +19° F.



C
AVALANCHE SIMULATOR PROBLEM

("SIMPLE" EXERCISE)

(5) (C)